GTR180
Service Manual

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I.PREFACE

THE CONTENTS OF THIS MANUAL PROVIDE THE AFTER SERVICE INFORMATION FOR CPI /GTR180

MOST CHAPTERS START WITH A SYSTEM OR ASSEMBLY ILLUSTRATION AND SPECIFICATIONS THE FOLLOWING PAGES GIVEN DETAILED PROCEDURES.

IF YOU DO NOT KNOW WHAT THE SOURCE OF THE TROUBLE IS, PLEASE GO TO THE TROUBLE SHOOTERS FOR ADDITIONAL HELP.

ALL THE CONTENTS OF THIS MANUAL ARE BASED ON THE LATEST MODEL INFORMATION AND CPI RESERVES THE RIGHT TO MAKE CHANGE AT ANY TIME WITHOUT NOTICE AND WITHOUT ANY RESPONSIBILITY OR ENGAGEMENT ON OUR PART.

II.TROUBLE SHOOTING

ENGINE WILL NOT BE STARTED OR HARD TO START

	FLOW PATH	BAD SITUATION	PROBABLE CAUSE
1	CHECK IF FUEL CAN BE REACHED CARBURETOR ↓ ***FUEL REACHES CARBURETOR***	FUEL DOES NOT REACH CARBURETOR	(1) NO FUEL IN TANK (2) CLOGGED FUEL LINE BETWEEN FUEL TANK AND CARBURETOR (3) CLOGGED FUEL VALVE (4) CLOGGED FUEL TANK CAP BREATHER HOLE
2	REMOVE SPARK PLUG AND TEST SPARK ↓ ***GOOD SPARK***	WEAK OR NO SPARK	(1) FAULTY OR FOULED PLUG (2) FAULTY C.D.I. (3) BROKEN OR SHORTED HIGH TENSION CORD (4) FAULTY IGNITION SWITCH (5) INCORRECT IGNITION TIMING
3	TEST CYLINDER COMPRESSION ↓ ***NORMAL COMPRESSION***	LOW COMPRESSION	(1) ENGINE NOT CRANKED (2) NO VALVE CLEARANCE (3) VALVE STUCK OPEN (4) WORN CYLINDER AND PISTON RINGS (5) BLOWN CYLINDER HEAD GASKET (6) FLAW IN CYLINDER HEAD (7) INCORRECT VALVE TIMING (8) BURNED VALVE
4	START ENGINE ↓ ***ENGINE FIRES***	ENGINE FIRES, BUT DOES NOT START	(1) CHOKE VALVE OPEN (2) CARBURETOR PILOT SCREW OPEN (3) AIR LEAKING THROUGH IN TAKE PIPE (4) INCORRECT IGNITION TIMING
5	REMOVE SPARK PLUG DRY PLUG	WET PLUG	(1) FLOODED CARBURETOR (2) CHOKE VALVE CLOSED
6	START ENGINE WITH CHOKE CLOSED		

II.TROUBLE SHOOTING

ENGINE LACKS POWER

	FLOW PATH	BAD SITUATION	PROBABLE CAUSE
1	RAISE WHEELS OFF GROUND AND SPIN ↓ ***WHEELS SPIN FREELY***	WHEELS DO NOT SPIN FREELY	(1) DRAGGING BRAKE (2) FAULTY WHEEL BEARING (3) OVERTIGHTENED DRIVE CHAIN (4) WHEEL BEARING NOT LUBRICATED PROPERLY
2	CHECK TIRE PRESSURE ↓ ***NORMAL PRESSURE***	INCORRECT TIRE PRESSURE	(1) PUNCTURED TIRE (2) FAULTY TIRE VALVE
3	RAPIDLY ACCELERATE FROM LOW TO SECOND ACCELERATES	DOES NOT ACCELERATE WITH ENGINE SPEED RAISED	(1) SLIPPING CLUTCH (2) WORN OR UNEVEN CLUTCH FACINGS (3) CLUTCH PLATE WARPED
4	REV UP GRADUALLY ENGINE SPEED INCREASED	ENGINE SPEED DOES NOT INCREASE	(1) CARBURETOR CHOKE CLOSED (2) CLOGGED AIR CLEANER (3) CLOGGED FUEL LINE (4) CLOGGED FUEL TANK CAP BREATHER HOLE (5) CLOGGED MUFFLER
5	CHECK IGNITION TIMING ↓ ***CORRECT TIMING***	INCORRECT TIMING	INCORRECT TIMING ADJUSTMENT
6	CHECK VALVE CLEARANCE ↓ ***CORRECT VALVE CLEARANCE***	INCORRECT VALVE	(1) INCORRECT VALVE CLEARANCE (2) WORN VALVE SEAT

II.TROUBLE SHOOTING

7	TEST CYLINDER COMPRESSION ↓ ***NORMAL COMPRESSION***	LOSS OF COMPRESSION	(1)VALVE STUCK OPEN (2) WORN CYLINDER AND PISTON RINGS (3) BLOWN CYLINDER HEAD GASKET (4) INCORRECT VALVE TIMING (5) FLAWS IN CYLINDER HEAD OR CYLINDER
8	CHECK CARBURETOR FOR CLOGGING *CARBURETOR* ↓ ***NOT CLOGGED***	CARBURETOR CLOGGED	(1) CARBURETOR JETS CLOGGED
9	REMOVE SPARK PLUG	PLUG FOULED OR DISCOLORED COLORED	(1) FOULED PLUG (2) INCORRECT HEAT RANGE PLUG
10	CHECK OIL LEVEL AND CONDITION ↓ ***CORRECT ENGINE OIL LEVEL***	OIL DIRTY OR LEVEL INCORRECT	(1) LEVEL TOO LOW OR HIGH (2) CONTAMINATED OIL
11	REMOVE CYLINDER HEAD COVER AND CHECK SUFFICIENTLY LUBRICATION	INSUFFICIENTLY LUBRICATED	(1) CLOGGED OIL PASSAGE (2) POOR OIL PUMP DELIVERY
12	CHECK IF ENGINE OVERHEATS *ENGINE DOES NOT OVERHEAT*	ENGINE OVERHEATS	(1) EXCESSIVE CARBON IN COMBUSTION CHAMBER (2) INCORRECT FUEL (3) SLIPPING CLUTCH
13	RAPIDLY ACCELERATE OR URN AT HIGH SPEED *ENGINE* ↓ ***DOES NOT KNOCK***	ENGINE KNOCKS	(1) WORN PISTON OR CYLINDER (2) MIXTURE TOO LEAN (3) INCORRECT FUEL (4)EXCESSIVE CARBON IN COMBUSTION CHAMBER (5) LGNITION TIMING TOO EARLY

POOR PERFORMANCE AT IDLE AND LOW SPEEDS

	FLOW PATH	BAD SITUATION	PROBABLE CAUSE
1	CHECK IGNITION TMING AND VALVE CLEARANCE ↓ ***CORRECT TIMING AND CLEARANCE***	INCORRECT TIMING AND CLEARANCE	(1) INCORRECT TIMING ADJUSTMENT (2) INCORRECT VALVE CLEARANCE
2	CHECK CARBURETOR PILOT SCREW ADJUSTMENT ↓ ***CORRECTLY ADJUSTED***	INCORRECTLY ADJUSTED	(1) MIXTURE TOO LEAN (2) MIXTURE TOO RICH
3	CHECK FOR AIR LEAKS ↓ ***NO AIR LEAKS***	AIR LEAKS	(1) FAULTY CARBURETOR PACKING (2) CARBURETOR NOT SECURELY TIGHTENED (3) FAULTY INTAKE PIPE GASKET
4	REMOVE SPARK PLUG AND TEST SPARK	WEAK OR INTERMITTENT SPARK	(1) FAULTY OR FOULED PLUG (2) FAULTY C.D.I. (3) MAGNET AT FAULT

POOR PERFORMANCE AT HIGH SPEED

	FLOW PATH	BAD SITUATION	PROBABLE CAUSE
1	CHECK IGNITION TIMING AND VALVE CLEARANCE ↓ ***CORRECT TIMING AND CLEARANCE***	INCORRECT TIMING AND CLEARANCE	(1) INCORRECT TIMING ADJUSTMENT (2) INCORRECT VALVE CLEARANCE
2	DISCONNECT FUEL LINE AT CARBURETOR AND CHECK FOR CLOGGING ↓ ***UNRESTRICTED FUEL FLOW***	RESTRICTED FUEL FLOW	(1) EMPTY FUEL TANK (2) CLOGGED FUEL LINE (3) CLOGGED FUEL TANK CAP BREATHER HOLE (4) CLOGGED FUEL PETCOCK
3	CHECK FUEL FILTER, FUEL VALVE AND CARBURETOR JET FOR CLOGGING ↓ ***NOT CLOGGED***	CLOGGED	(1) CLOGGED JET (2) CLOGGED FUEL FILTER (3) CLOGGED FUEL VALVE
4	REPLACE CARBURETOR MAIN JET ↓ ***CONDITION IMPROVED***	CONDITION AGGRAVATED	(1) JET SIZE TOO SMALL (2) IF CONDITION IS IMPROVED WITH SMALL JET: (A) CLOGGED AIR CLEANER (B) CHOKE NOT OPENED FULLY
5	CHECK VALVE TIMING ↓ ***CORRECT***	INCORRECT	INCORRECT VALVE TIMING ADJUSTMENT
6	CHECK VALVE SPRING TENSION ↓ *SPRING TENSION CORRECT*	WORN OR BROKEN SPRING	FAULTY VALVE SPRING

II.TROUBLE SHOOTING

SMOKY EXHAUST

	FLOW PATH	BAD SITUATION	PROBABLE CAUSE
1	RUN MOTORCYCLE A LONG DISTANCE AT HIGH SPEED THIN EXHAUST EMITTED	BLACK SMOKE EMITTED	(1) WORN CYLINDER AND PISTON RINGS (2) OIL LEVEL TOO HIGH (3) PISTON RINGS INCORRECTLY INSTALLED (4) FAULTY PISTON OR CYLINDER (5) FLAWS IN CYLINDER HEAD
2	RETURN THROTTLE GRIP QUICKLY	WHITE SMOKE EMITTED	(1) WORN INTAKE VALVE GUIDE OR STEM (2) EXCESSIVE VALVE-TO-GUIDE CLEARANCE

POOR HANDLING

	FLOW PATH	BAD SITUATION	PROBABLE CAUSE
1	IF STEELING IS HEAVY	CHECK TIRE PRESSURE	(1) STEERING HEAD ADJUSTER TOO TIGHT (2) DAMAGED STEERING CONES OR STEEL BALLS
2	IF EITHER WHEEL IS WOBBLING		(1) EXCESSIVE WHEEL BEARING PLAY (2) DISTORTED RIM (3) IMPROPERLY INSTALLED WHEEL HUB (4) SWING ARM PIVOT BUSHING EXCESSIVELY WORN (5) DISTORTED FRAME (6) IMPROPER DRIVE CHAIN TENSION OR ADJUSTMENT
3	IF THE MOTORCYCLE PULLS TO ONE SIDE		(1) MISAPPLIED SHOCK ABSORBER (2) FRONT AND REAR WHEELS NOT ALIGNED (3) BENT FRONT FORK (4) BENT SWING ARM

III.SERVICE INFORMATION

ITEM		STANDARD
IGNITION MODE		CDI
SPARK TYPE		NGK
SPARK PLUG		DPR7EA-9
SPARK PLUG CLEARANCE		0.7-0.8㎜
IGNITION TIME	MAX	33°BTDC/5000±100rpm
PULSER COIL MAX VOLTAGE		≧0.8V
EXCITER COIL MAX VOLTAGE		≧150V

ITEM			STANDARD
BATTERY	CAPACITANCE		12V-8AH
	(20℃) VOLTAGE	FULL CHARGE	12.8V
		UNDER CHARGE	11.8V
	CHARGING AMPERAGE		0.4A STANDARD, PRESTO4.0A
	CHARGING PERIOD0		5-10hr STANDARD, PRESTO 30min
A. C. GENERATOR	TYPE		MAGNETO
	OUTPUT		Three-phase alternating current
	(20℃)CHARGING COIL		0.2-0.3Ω

ITEM			STANDARD
	COMPRESSION		700kPa(7.0kgf/c㎡)-260r/min
	FRONT BARKE LEVER CLEARANCE		10-30㎜
	REAR BARKE LEVER CLEARANCE		10-30㎜
	FRONT TYPE		110/70-17PR
	REAR TYPE		120/80-16PR
	SPARK PLUG CLEARANCE		0.7-0.8㎜
	SPARK PLUG		DPR7EA(NGK)
	VALVE CLEARANCE	IN	0.05㎜
		EX	0.20㎜
	IDLE SPEED		1600±100rpm
	OIL CAPACITY	FULL	1.0ℓ
		CHANGING	0.8ℓ
	GAER OIL CAPACITY	DISASSEMBLY	200cc
		CHANGING	150cc

III.SERVICE INFORMATION

ITEM	STANDARD
FLOAT HEIGHT	30±0.5
MAIN JET	#97.5
PILOT JET	#15
IDLE SPEED	1600±100 rpm
PILOT SCREW	1+1/2 ROUND

ITEM		STANDARD	SERVICE
OIL PUMP	PUMP TIP CLEARANCE	0.05~0.10mm	0.12mm
	ROTOR-TO-BODY	015~0.23mm	0.25mm
	INNER & OUTER CLEARANCE	0.15mm	0.20mm

UNIT : ㎜

ITEM		STANDARD	SERVICE LIMIT
VALVE CLEARANCE	IN	0.05mm	———
	EX	0.20mm	———
COMPRESSION		700kPa(7.0kgf/㎠)-260rpm	———
CAM LOBE HEIGHT	IN	30.74-30.86mm	30.69mm
	EX	30.33-30.45mm	30.28mm
ROCKER ARM I. D.	IN	10.000-10.015mm	10.10mm
	EX	10.000-10.015mm	10.10mm
ROCKER ARM SHAFT O. D.	IN	9.972-9.987mm	9.91mm
	EX	9.972-9.987mm	9.91mm
VALVE SEAT WIDTH	IN	0.9-1.1mm	1.8mm
	EX	0.9-1.1mm	1.8mm
VALVE STEM O. D.	IN	4.975-4.990mm	4.965mm
	EX	4.955-4.970mm	4.945mm
VALVE GUIDE I. D.	IN	5.000-5.012mm	5.04mm
	EX	5.000-5.012mm	5.04mm
VALVE STEM-TO-VALVE GUIDE CLEARANCE	IN	0.010-0.037mm	0.075mm
	EX	0.030-0.057mm	0.095mm

III.SERVICE INFORMATION

UNIT : ㎜

ITEM	STANDARD	SERVICE LIMIT
SPEED GEAR MOVABLE DRIVE FACE COMP.	24.007-24.028mm	34.06mm
DRIVEN BELT WIDTH	21.7-23.3mm	20.7mm
DRIVE PALTE COLLAR O. D.	23.959-23.98mm	23.92mm
CLUTCH LINING THINNESS	———	2.75mm
CLUTCH OUTER I. D.	124.5-124.2mm	125mm
SPRING FREE LENGTH	144-146mm	140mm
DRIVEN FACE O. D.	33.95-33.975mm	33.92mm
MOVABLE DRIVEN FACE I. D.	34.000-34.025mm	34.06mm
WEIGHT ROLLER O. D.	19.95-20.05mm	19.45mm

ITEM			STANDARD	SERVICE LIMIT
CYLINDER	I. D.		58-58.019mm	58.049 mm
	TAPER		———	0.05 mm
	OUT OF ROUND		———	
	WAR PAGE ACROSS TOP		———	0.05 mm
PISTON	RING-TO-RING GROOVE CLEARANCE	TOP	0.02-0.044 mm	0.07 mm
		SECOND	0.02-0.044 mm	0.07 mm
	PISTON RING END CLEARANCE	TOP	0.15-0.30 mm	0.45 mm
		SECOND	0.10-0.25 mm	0.45 mm
		OIL SIDE RAIL	0.2-0.7 mm	0.9 mm
	PISTON O. D. AT SKIRT		57.97-57.99mm	57.92mm
	PISTON-TO-CYLINDER CLLEARANCE		0.02-0.04mm	0.08mm
	PISTON PIN BORE I. D.		15.002-15.008	15.04
PISTON PIN O. D.			14.994-15.000	14.98

	ITEM	STANDARD	SERVICE LIMIT
CRANK SHAFT	ROD BIG SIDE AXIAL CLEARANCE	0.16-0.304mm	0.5mm
	ROD BIG END RADIAL CLEARANCE	0.005-0.017mm	0.05mm
	RUNOUT	———	0.10mm

III.SERVICE INFORMATION

TORQUE

TORQUE STANDARD

SORTS	*TORQUE(kg-m)*
5mm screw, nut	0.5
6mm screw, nut	1.2
8mm screw, nut	2.7
10mm screw, nut	4.0
12mm screw, nut	5.5

INNER OF ENGING

ITEM	*AMOUNT*	*DIAMETER(mm)*	*TORUQUE(kg-m)*	*REMARKS*
Cylinder head bolt, A	2	8	3.0	Stud bolt side
Cylinder head bolt, B	2	8	3.0	Stud bolt side
Strainer cover	1	36	1.5	Spread on thread
EXH. pipe joint bolt	2	8	0.9	Spread on thread
Tappet adj. nut	2	5	0.9	
C.C guide COMP. bolt	1	8	0.9	
Oil bolt	1	12	1.3	
Clutch outer nut	1	12	5.5	
Drive face nut	1	14	5.5	
A.C.G. nut	1	14	5.5	
Oil pump bolt	2	6	0.4	
Cylinder head cover bolt	2	6	1.2	
Spark plug	1	12	1.2	
Cam chain adj. bolt	2	6	0.9	
Impeller shaft(L-thread)	1	7	1.4	

FRAME

ITEM	*AMOUT*	*DIAMETER(mm)*	*TORQUE(kg-m)*
Shaft steering nut	1	10	4.5
FR. Wheel axle nut	1	12	6.0
RR. Wheel axle nut	1	16	9.0
RR. shock absorber bolt (up)	1	10	3.0
RR. shock absorber bolt (down)	1	8	3.0
ENG. Hanger BRKT. Bolt	1	10	5.5

III.SERVICE INFORMATION

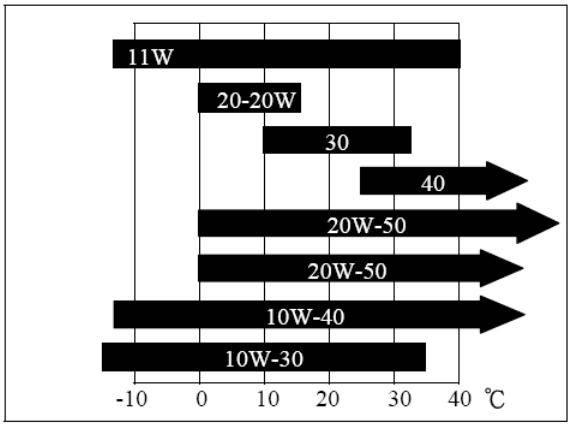
MAINTENANCE SCHEDULE

To inspect (or to clear, lubricate, replenish, repair and replace if it's necessary)
A：adjust、C：clear、R：replace、T：tight

Item \ Times	Which → / first ↓	Total kilometers for driving									
		Km 1000	Km 2000	Km 3000	Km 4000	Km 5000	Km 6000	Km 7000	Km 8000	Km 9000	Km 10000
Engine oil		New R 300km	R	R	R	R	R	R	R	R	R
Oil filter screen		New C 300km	C			C					C
Fuel filter screen		New C 300km				C					C
Gear oil	※3	New C 300km				R					R
Valve clearance			A、T			A、T					A、T
Carburetor			T			T					T
Air cleaner	※2、3		C			R					R
Spark plug			T								R
Drive belt			T			T					T
Engine bracket					T				T		
Whole nuts & bolts		T	T	T	T	T	T	T	T	T	T
Tire		Inspect before driving									
Steering bolts		T				T					T
Brake liquid		Inspect before driving									
Cooling liquid		Per year or 10000 kilometers（R）									
Cooling tank			T			T					T
Cooling tank cap			T			T					T
Brake lever											
Brake disc			T			T					T
Shock absorber						T					T

III.SERVICE INFORMATION

◎We suggest that above maintenance should be executed in designated dealers to ensure driving safe.
Remarks:
1. If you drive to exceed above stipulated kilometers, please reduplicate the inspection.
2. Must inspect or replace early if you drive in the region which has much dust or it's rainy.
3. Must inspect or replace early if you drive on a long-distance or bear a heavy burden.
4. Please refer to the following chart to replace oil:



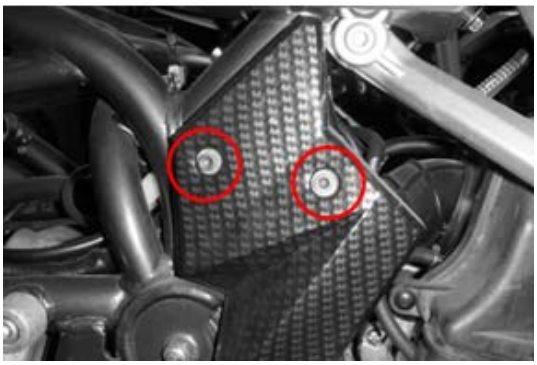
IV.ENGINE REMOVAL&INSTALLATION

ENGINE REMOVAL

REMOVAL SIDE COVER,3(LEFT)

1.Removal 2 socket bolt

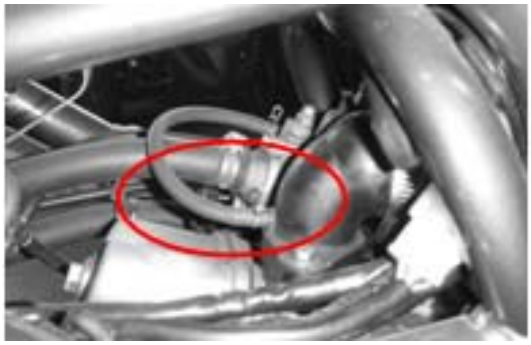
2. Disassemble “SIDE COVER, 3”



Disassemble “FUEL HOSE, 3”

ATTENTION!!!
Be careful of the gasoline leakage.

Removal “VACCUM HOSE”

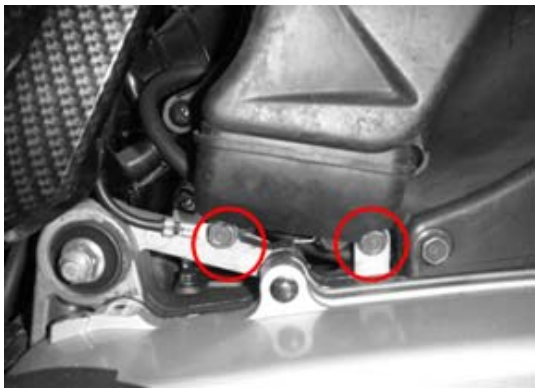


Removal “CARBURATOR VACCUM HOSE”

IV.ENGINE REMOVAL&INSTALLATION

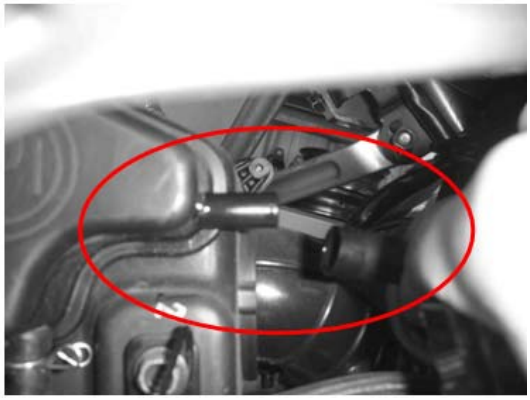
REMOVAL AIR CLEANER

1. Removal 2 flange bolt



2. Removal 1flange bolt

Removal the oil hose



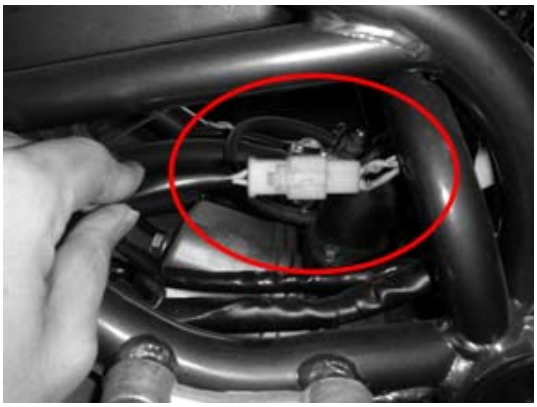
3. Disassemble the clamp

IV.ENGINE REMOVAL&INSTALLATION

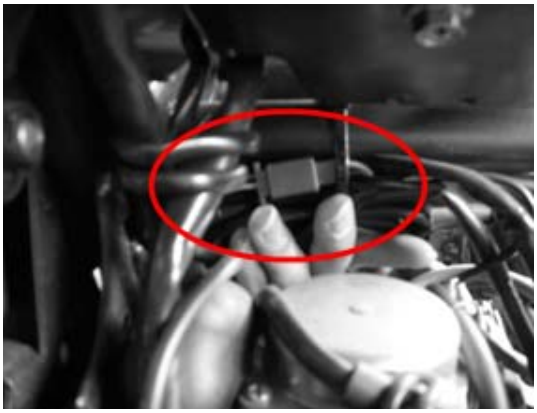
REMOVAL ELECTRIC

1.Removal “IGNITION COIL”

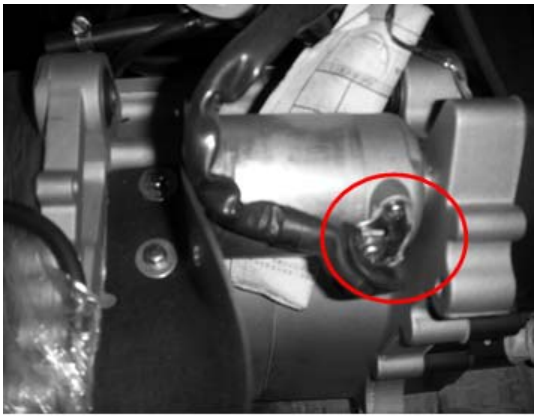
2.Disassemble “RECTIFIER” joint



3.Disassemble “AUTO-CHECK” joint



4.Removal “START MOTOR” line

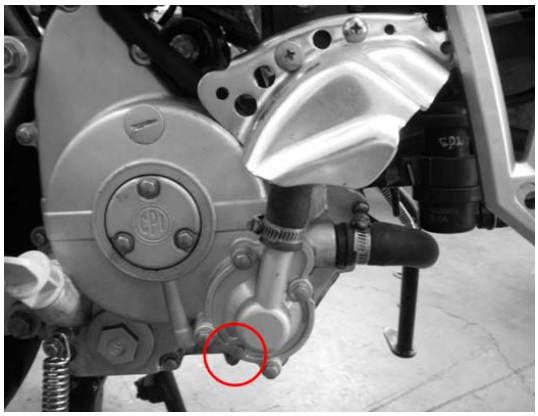


IV.ENGINE REMOVAL&INSTALLATION

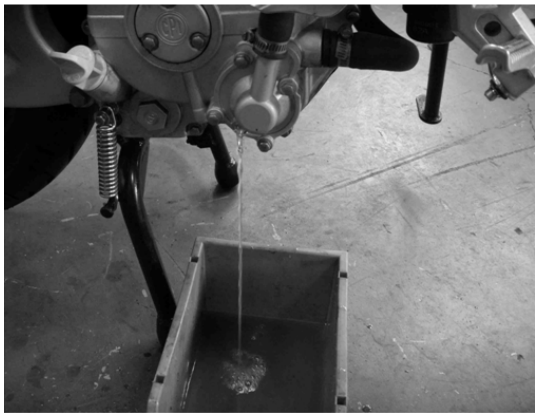
Removal “THROTTLE CABLE”

Removal “TEMPERATURE SENSOR” joint

Removal the bolt

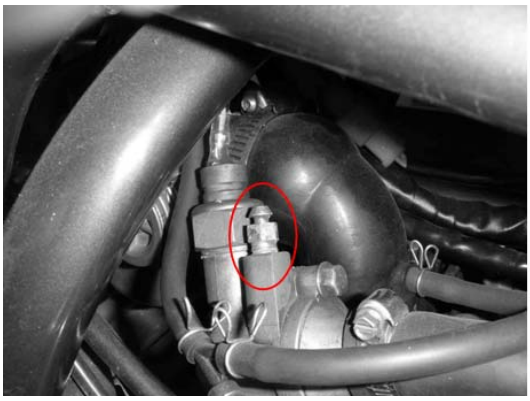


Make cooling water leak out



IV.ENGINE REMOVAL&INSTALLATION

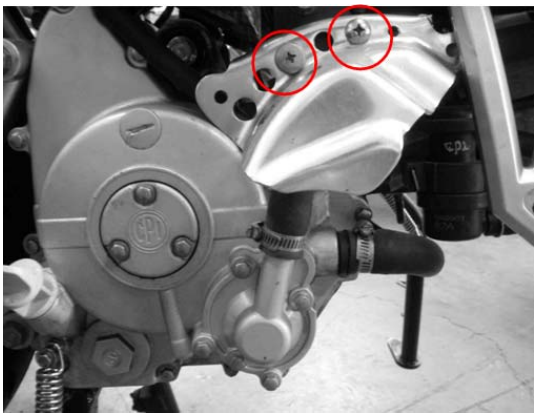
You can use leak air bolt to control of leaking out speed.



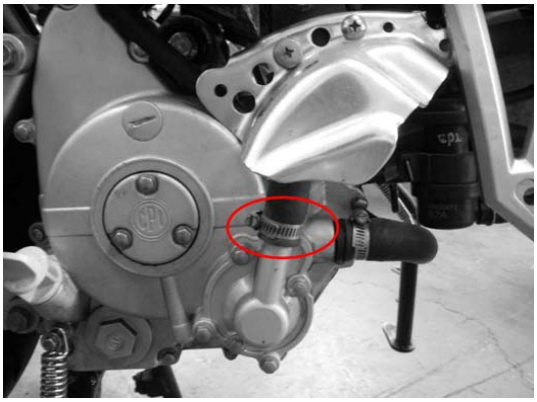
REMOVAL HOT WATER PIPE ASSY.

1.Rmoval the clamp

2.Removal 2 pan head bolt



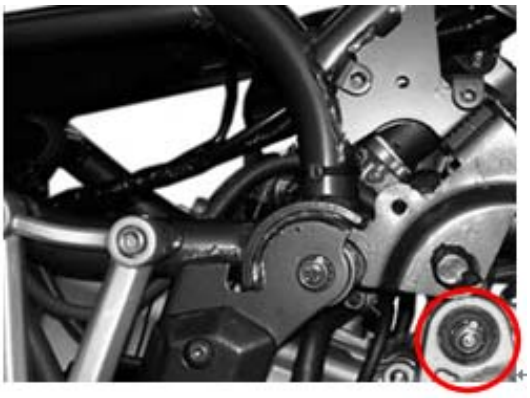
3.Removal the clamp



IV.ENGINE REMOVAL&INSTALLATION

REMOVAL ENGINE INSTALL BOLT

1.Removal the nut



2.Removal the bolt

IV.ENGINE REMOVAL&INSTALLATION

ENGINE INSTALLATION

The installation sequence is essentially the reverse of removal.

NOTE
Route all the wire and cable properly. Adjust the throttle cable free play clearance. Adjust the rear brake free play.

EMPTY INTO COOLING WATER

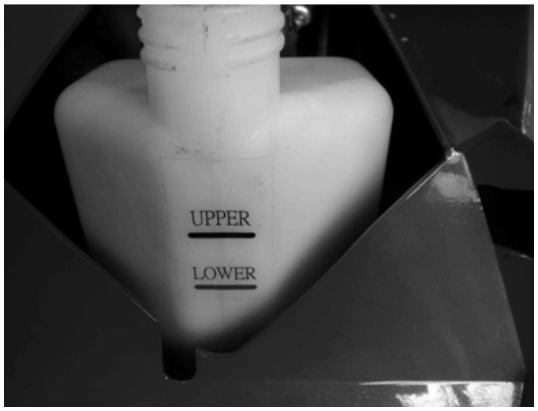
1.Open 2 cap

2.Make cooling water empty into “OUTLET WATER ELBOW” & “RESERVE TANK”

IV.ENGINE REMOVAL&INSTALLATION

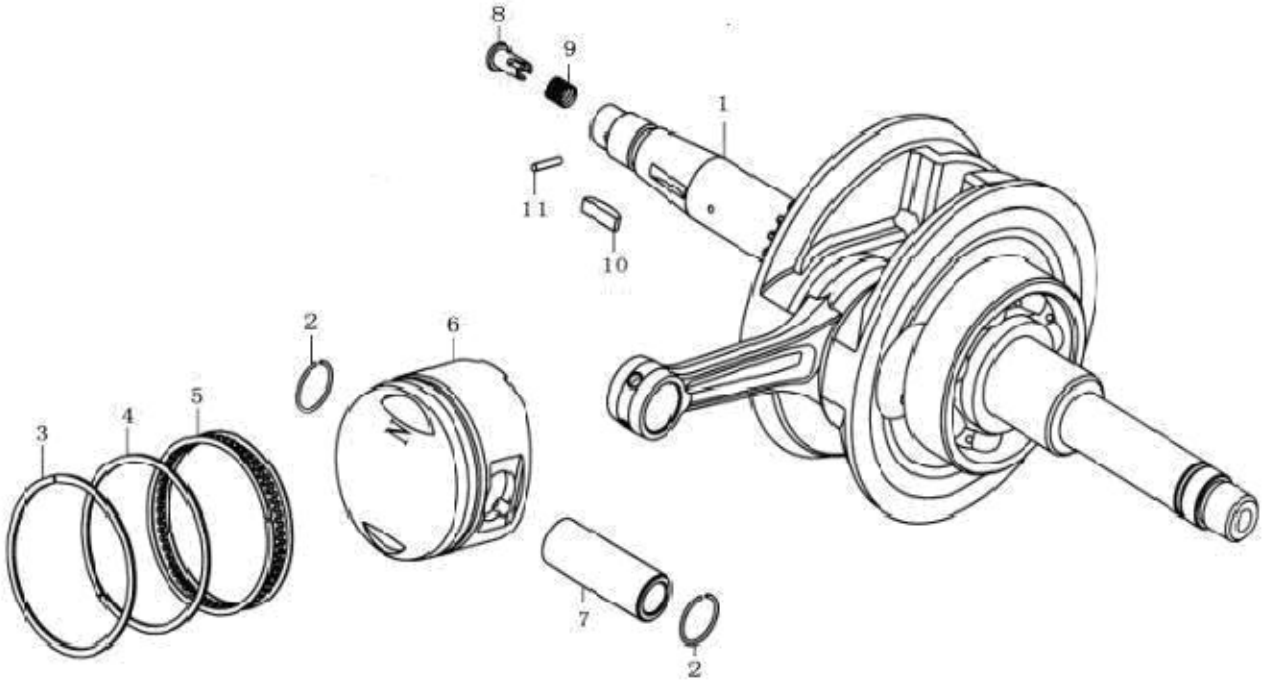
Makes cooling water full in outlet water elbow.

Makes cooling water full with lower between upper.



V.CYLINDER & PISTON

CRANK SHAFT/PISTON EXPLODED VIEW



V.CYLINDER & PISTON

SERVICE INFORMATION

GENERAL INSTRUCTIONS

The cylinder and piston can be serviced with the engine installed in the frame.

When installing the cylinder, use a new cylinder gasket and make sure that the dowel pins are correctly installed.

After disassembly, clean the removed parts and dry them with compressed air before inspection.

SPECIFICATIOS			STANDARD (mm)	SERVICE LIMIT(mm)
CYLINDER	I.D.		57.4~57.401	57.3
	WARPAGE		—	0.05
	CYLINDRICITY		—	0.05
	TRUE ROUNDNESS		—	0.05
PISTON, PISTO RING	RING-TO-GROOVE CLEARANCE	TOP	0.025~0.060	0.090
		SECOND	0.015~0.050	0.090
	RING END GAP	TOP	0.100~0.250	0.500
		SECOND	0.250~0.400	0.650
		OIL SIDE RAIL	0.200~0.800	—
	PISTON O.D.		57.365~57.395	57.3
	PISTON O.D MEASURING POSITION.		9mm from bottom of skirt	—
	PISTON-TO-CYLINDER CLEARANCE		0.010~0.040	0.100
	PISTON PIN HOLE I.D.		15.002~15.008	15.040
PISTON PIN O.D.			14.994~15.000	14.960
PISTON-TO-PISTON PIN CLEARANCE			0.002~0.014	0.020
CONNECTION RID SMALL END I.D. BORE			15.016~15.034	15.060

V.CYLINDER & PISTON

TROUBLESHOOTING

When hard starting or poor performance at low speed occurs, check the crankcase breather for white smoke. If white smoke is found, it means that the piston rings are worn, stuck or broken.

COMPRESSION TOO LOW OR UNEVEN COMPRESSION

Worn or damaged cylinder and piston rings.

Worn, stuck or broken piston rings.

COMPRESSION TOO HIGH

Excessive carbon build-up in combustion chamber or on piston head.

EXCESSIVE SMOKE FROM EXHAUST MUFFLER

Worn or damaged piston rings
Worn or damaged cylinder and piston

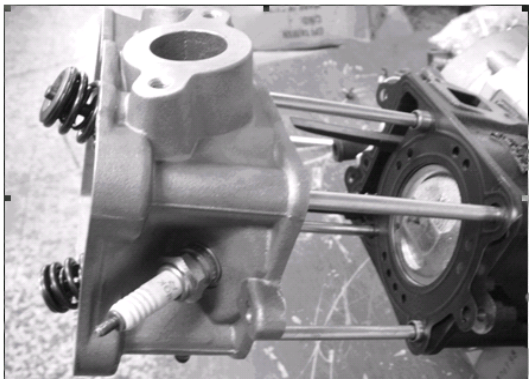
ABNORMAL NOISY PISTON

Worn cylinder, piston and piston rings
Worn piston pin hole and piston pin
Incorrectly installed piston

V.CYLINDER & PISTON

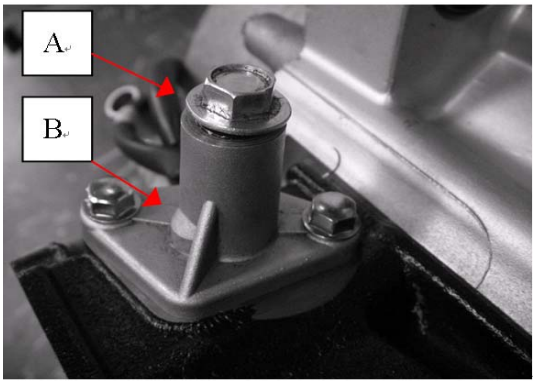
CYLINDER REMOVAL

Disassemble the cylinder head comp.
Disassemble the cylinder head gasket.



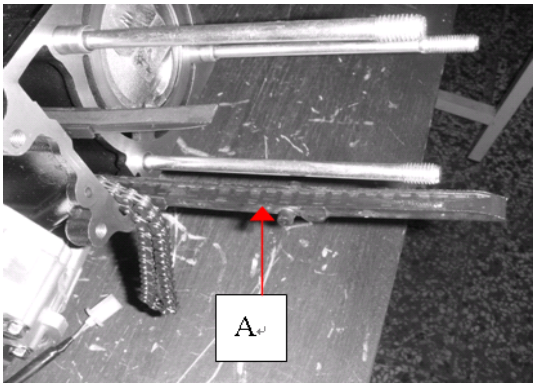
Remove:
1.Cylinder head comp. [A]
2.Cylinder head gasket. [B]

Loosen the tensioner lifter cap.
Disassemble the tensioner lifter comp.



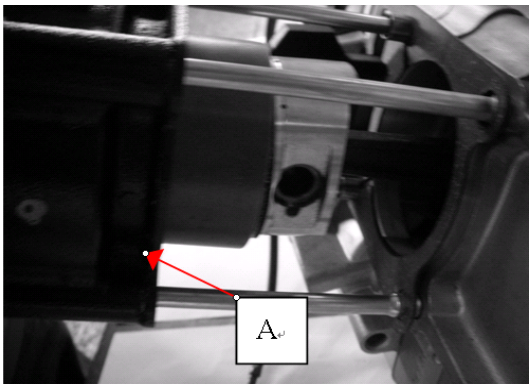
Remove:
1.Tensioner lifter cap. [A]
2.Tensioner lifter comp. [B]

Disassemble the cam chain guide



Remove:
1.Cam chain guide [A]

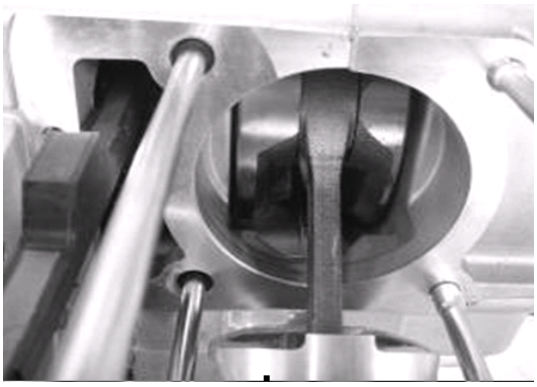
Disassemble the flange bolt.
Disassemble the cylinder.



Remove:
1.Cylinder [A]

V.CYLINDER & PISTON

Clean any gasket material from the cylinder surface.

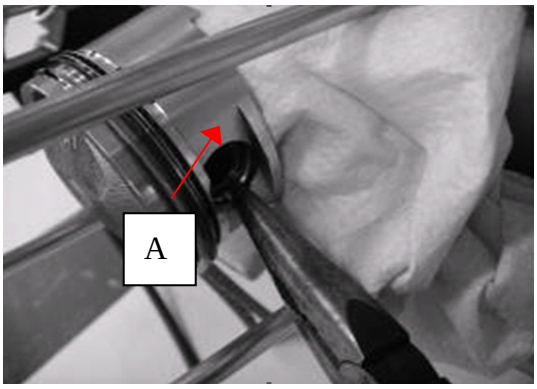


Disassemble the piston pin clip.

Remove:

1.Piston pin clip[A]

NOTE
Place a clean shop towel in the crankcase to keep the piston pin clip from falling into the crankcase.



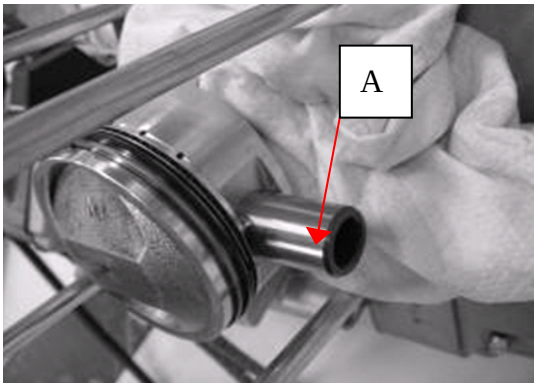
Disassemble the piston pin.

Press the piston pin out of the piston

Disassemble:

1.Piston Pin [A]

NOTE
Do not reuse pin clip, as removal weakens and deform them. They could fall out and score the cylinder wall.



Inspect the piston, piston pin and piston rings.

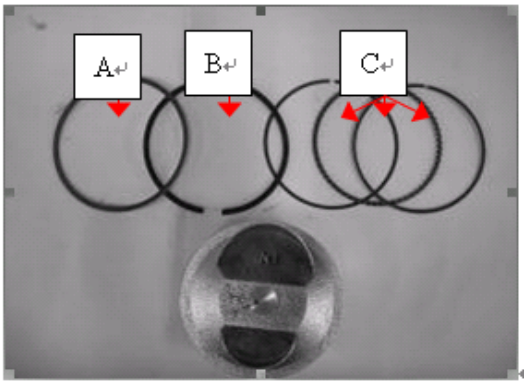
Remove the piston rings.

Clean carbon deposits from the piston ring grooves.

V.CYLINDER & PISTON

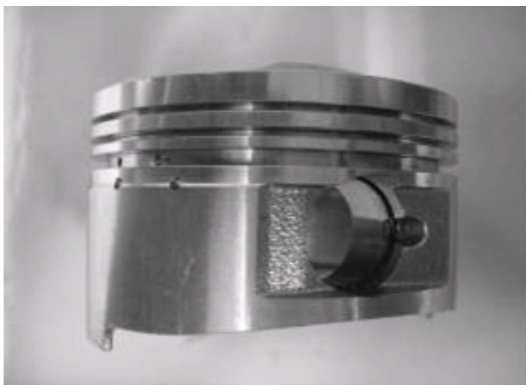
INSPECTION PISTON/PISTON RING

Disassemble the piston rings.
Disassemble:
1.Top Ring [A]
2.Second ring [B]
3.Oil ring set [C]



NOTE
Take care not to damage or break the piston rings during removal.

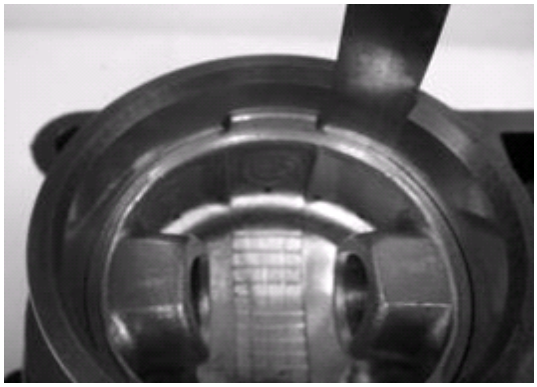
Clean the grooves for carbon deposit completely.



Measure the piston ring-to-groove clearance with a feeler gauge.

SERVICE LIMITS:
TOP: 0.07㎜
SECOND: 0.07㎜

Remove the piston rings insert each piston ring into the cylinder with the piston and measure the ring end gap in the cylinder to a point 10 ㎜(0.4in) from the bottom.
Use the piston head to push each piston ring into the cylinder.
SERVICE LIMITS : 0.5 ㎜



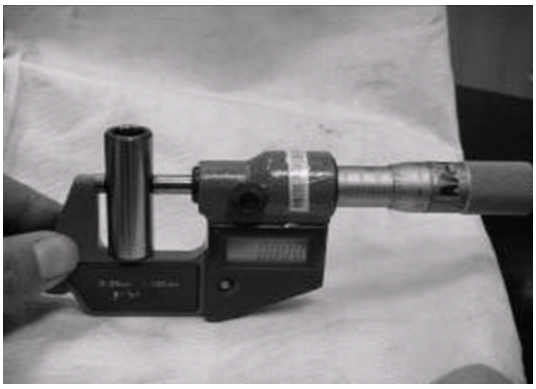
V.CYLINDER & PISTON

Measure piston pin bore I. D. in two directions at right angle to each other.

SERVICE LIMITS : 15.04 ㎜

Measure the piston pin O. D. at the front, center and rear and in tow directions across from each other.

SERVICE LIMIT : 14.98 ㎜

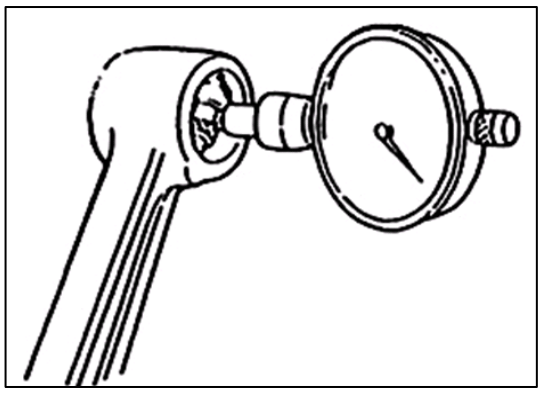


Measure the cylinder I.D. at a point 10 ㎜ from the bottom.

SERVICE LIMITS:57.1 ㎜

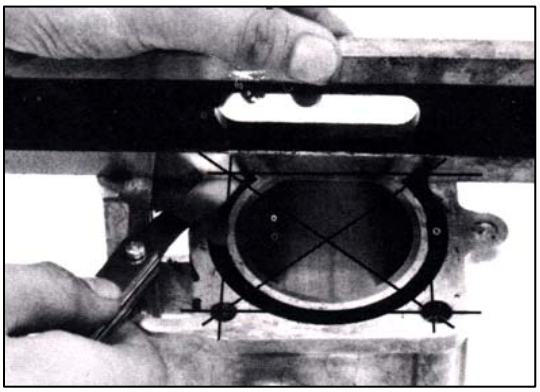
Measure the connecting rod small end I.D.

Service Limit: 17.06mm replace if over.



V.CYLINDER & PISTON

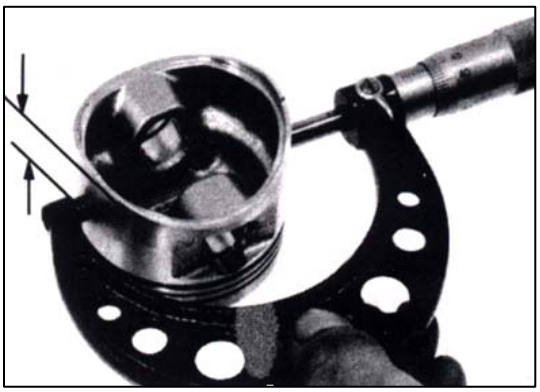
Inspect the top of the cylinder for warpage.



Service Limit: 0.05mm repair or replace if over

Measure the piston O.D.

Service Limit: 57.3mm replace if below



NOTE
Take measurement at 9mm from the bottom and 90° to the piston pin hole.

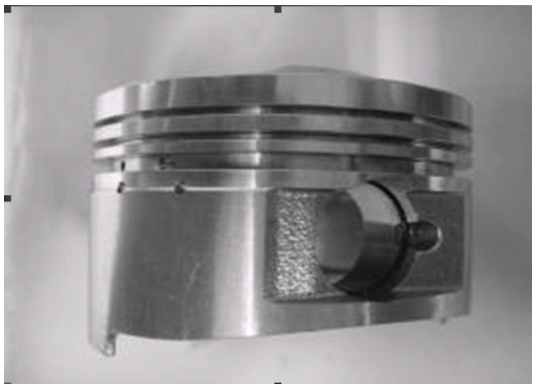
Measure the piston-to-piston pin clearance.

Service Limit: 0.1 mm replace if over

V.CYLINDER & PISTON

PISTON RING INSTALLATION

Clean the piston ring groves thoroughly



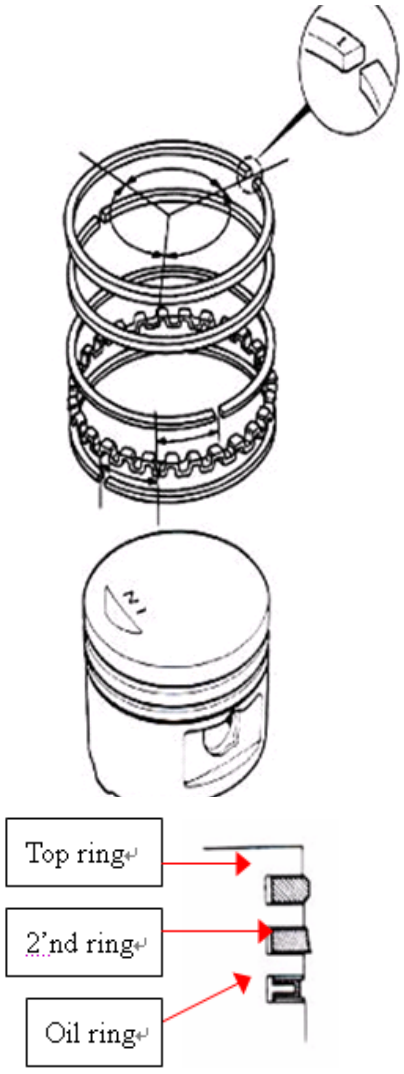
Install the piston ring. Space the piston ring end gaps 120 degrees apart.

The gap of the three-piece oil ring should correspond with the gap of spacer.

PS：

When installing the oil ring, install the spacer first and then the rails.

NOTE
Avoid piston and piston ring damage during installation. All ring should be installed with the markings facing up. After installation, the piston rings should be free to rotate in the grooves. Do not mix the top and second rings.

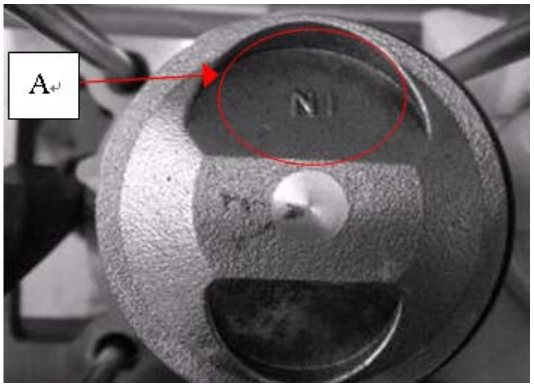


V.CYLINDER & PISTON

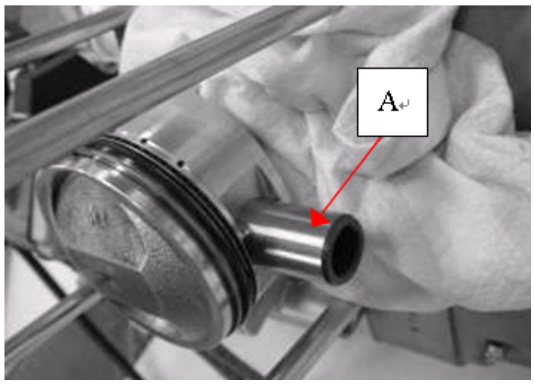
PISTON INSTALLATION

Install the piston.

NOTE
Position the piston “IN” mark on the intake valve side. [A]



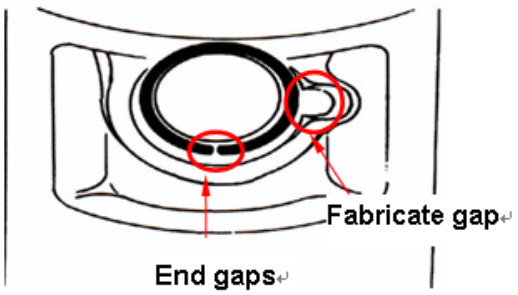
Install the piston & piston pin.



Install the new piston pin clips.

NOTE
Use clean cloth stop up the crankcase hole and cam chain hole. Be avoiding the clip fall into the crankcase.

The piston ring end gaps should not be parallel with or at 90° to the piston pin.



V.CYLINDER & PISTON

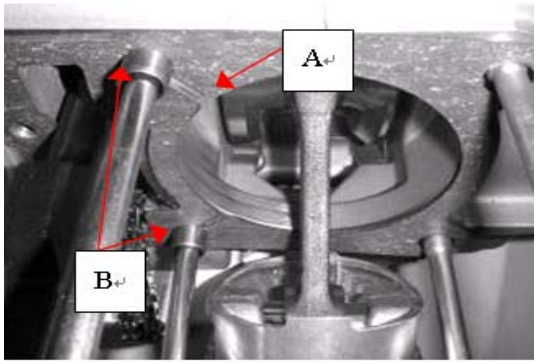
CYLINDER INSTALLION

Install the cylinder gasket and dowel pins.

Install:

1.Cylinder gasket.[A]

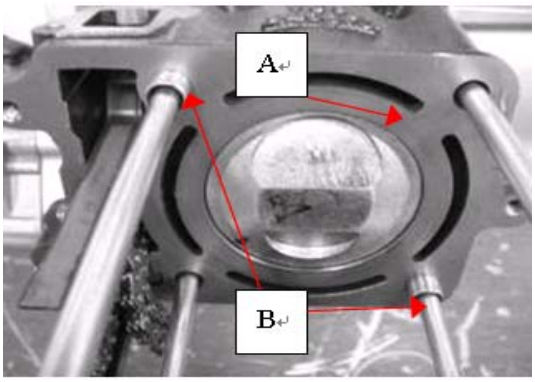
2.Dowel pins [B]



NOTE
Apply some oil at cylinder wall before piston ring assemble into cylinder.

Install the cylinder & dowel pins

NOTE
Coat the cylinder and piston ring with the clean engine oil.



Install:

1.Cylinder [A]

2.Dowel pins [B]

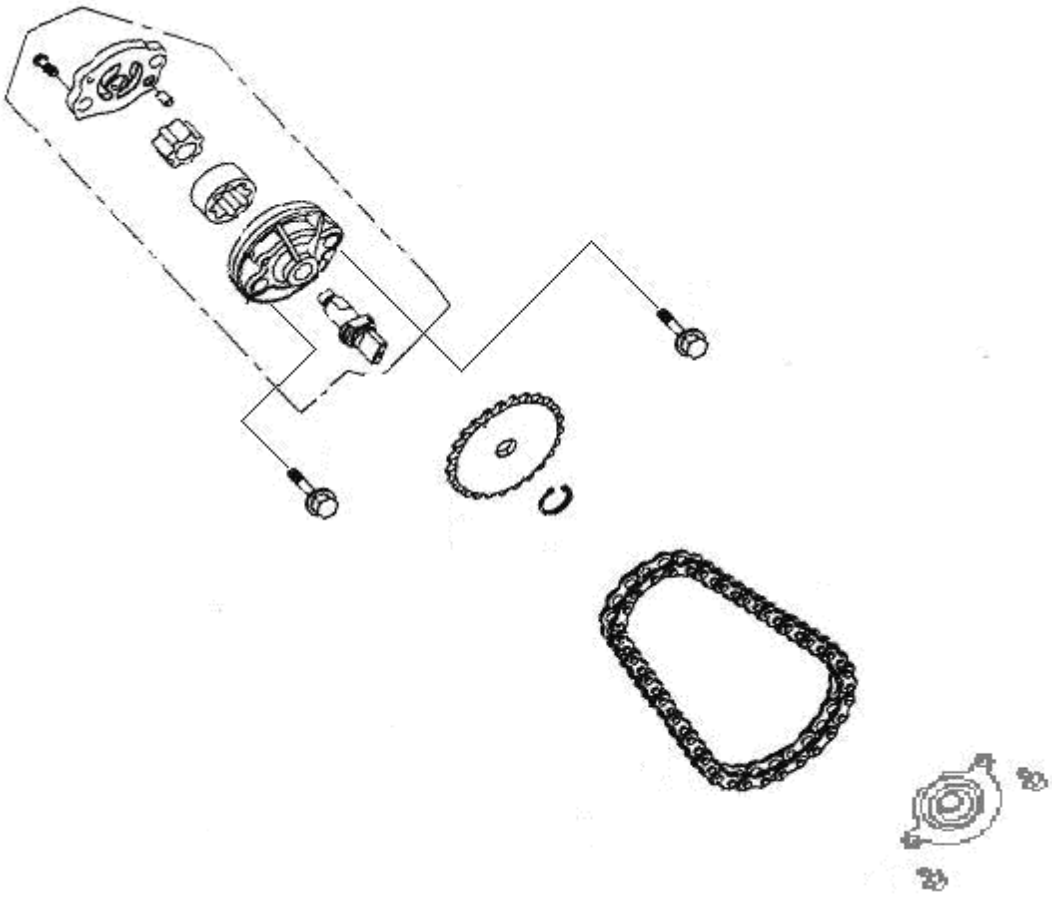
V.CYLINDER & PISTON

MEMO….

V.CYLINDER & PISTON

VI.OIL PUMP REMOVAL

OIL PUMP EXPLODED VIEW



VI.OIL PUMP REMOVAL

GENERAL INSTRUCTIONS

The maintenance of lubrication system can be performed with the engine installed in the frame.

Drain the coolant before starting any operations.

Use carefully when removing and installing the oil pump not to allow dust and foreign matters to enter the engine and oil line.

Do not attempt to disassemble the oil pump. The oil pump must be replaced as a set when it reaches its service limit.

After the oil pump is installed, please check each part for oil leaks.

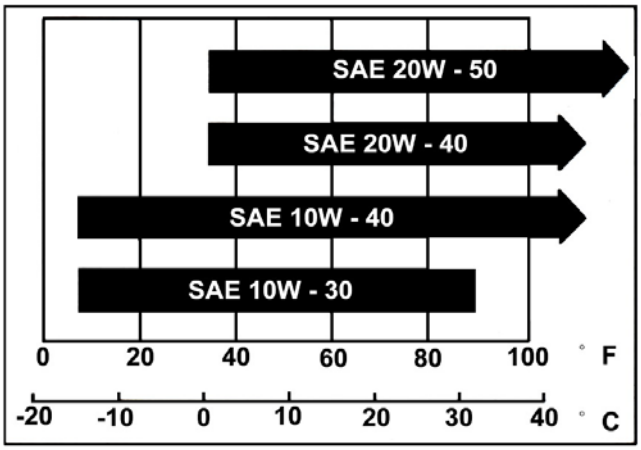
ENGINE OIL CAPACITY

Dissolution 1050 c.c.

Change 800 c.c.

The engine oil viscosity is SAE 10W-30

ENGINE OIL VISCOSITY



Gear oil

Dissolution 150 c.c.

Change 120 c.c.

The gear oil viscosity is SAE140

Unit：mm

ITEM		STANDARD	SERVICE LIMIT
Oil pump	Inner rotor-to-outer rotor clearance	0.15	0.20
	Outer rotor-to-pump body clearance	0.15~0.2	0.25
	Rotor end-to-pump body clearance	0.04~0.09	0.12

VI.OIL PUMP REMOVAL

TORQUE

Engine oil filter screen cover	1.3~1.7kgf-m	Gear oil filler bolt	1.0~1.4kgf-m
Engine oil drain plug bolt	3.5~4.5kgf-m	Oil pump screw	0.1~0.3kgf-m
Gear oil drain plug bolt	0.8~1.2kgf-m		

TROUBLE DECIDE

Oil too low：

Engine oil leak

Valve guide tube or oil seal is damage

Piston rings damage

Natural oil consumption

Worn piston rings

Worn valve guide

Worn valve guide seal

Oil contamination：

Oil not changed often enough

Faulty cylinder head gasket

Loose cylinder head bolts

Poor lubrication pressure：

Oil level too low

Clogged oil filter or oil passage

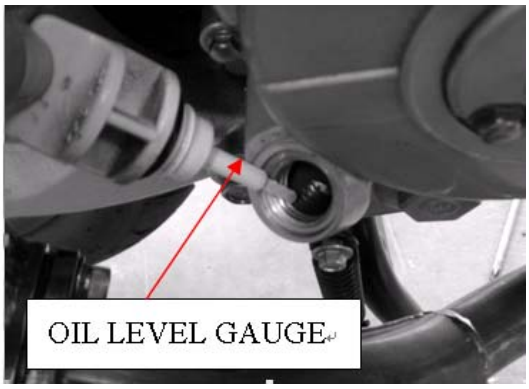
Faulty oil pump

Drain the engine oil

Turn off the engine, put the motor vertical the smooth road, after 3-5 minutes, and use the oil level gauge to check the oil reserve. Please don’t return the oil level gauge into right crankcase cover.

If the oil reserve closed the lower limit, add the engine oil to max.

Remove the setting bolts of the right crankcase cover.



VI.OIL PUMP REMOVAL

Change engine oil

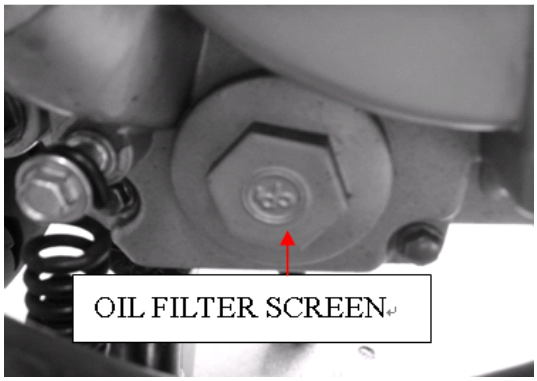
ATTENTION!!!
Please drain the engine oil when the warm engine which can assure the engine oil is smooth.

Put the dish under the engine, disassemble the drain plug bolt to drain engine oil. If drain plug bolt washer is damaged, it must change new one.
Lock the drain plug bolt.

Torque：3.5~4.5kgf-m

Clean the engine oil filter screen

Disassemble the tappet adj. cap assy.
Get out of the engine filter screen and spring.
Clean the engine oil filter screen.
Check the tappet adj. cap assy. ring and filter, if it was damaged, it must change new one.
Install the engine oil filter and spring.
Lock the tappet adj. cap assy.



Torque：1.3~1.7kgf-m

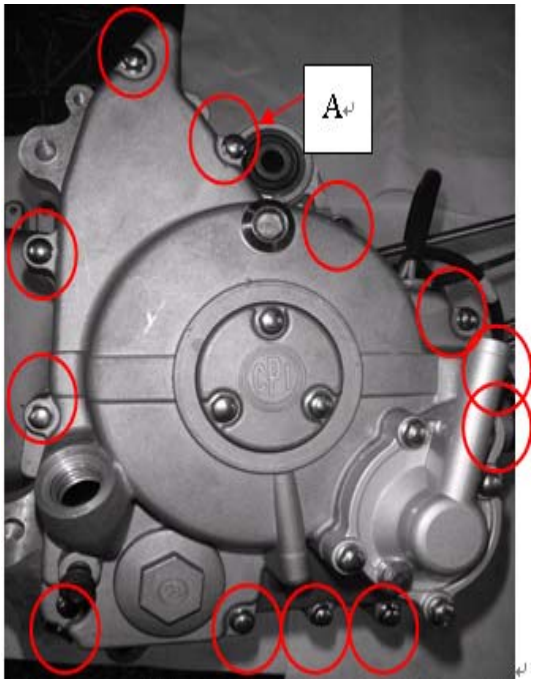
Put engine oil pour tank filler sleeve

Engine oil volume：change 800 c.c.

Install oil level gauge comp. to start the engine and idle several minutes.
Stop the engine, after 3-5 minutes, use the oil level gauge check the oil reserve which is stand or not.
Check the engine appearance leak of engine oil.

VI.OIL PUMP REMOVAL

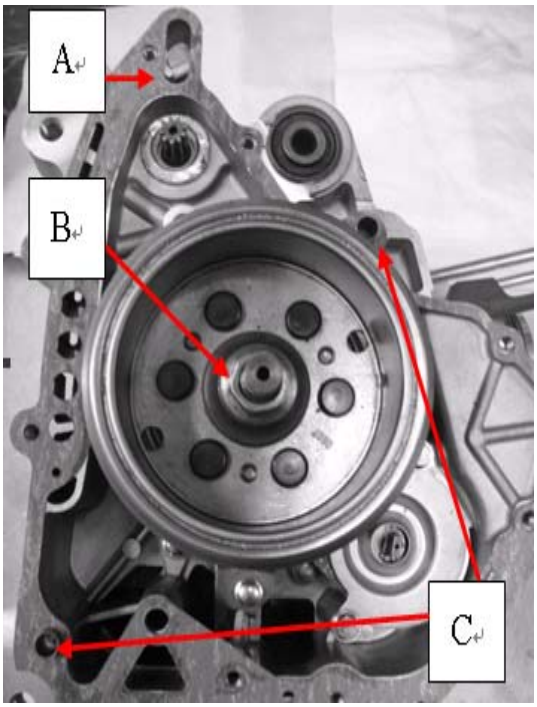
DISASSEMBLE OIL PUMP



Disconnect the water hoses from the right crankcase cover.
Remove the twelve bolts attaching the right crankcase cover and the cover.

Remove:
1. Flange bolts [A]

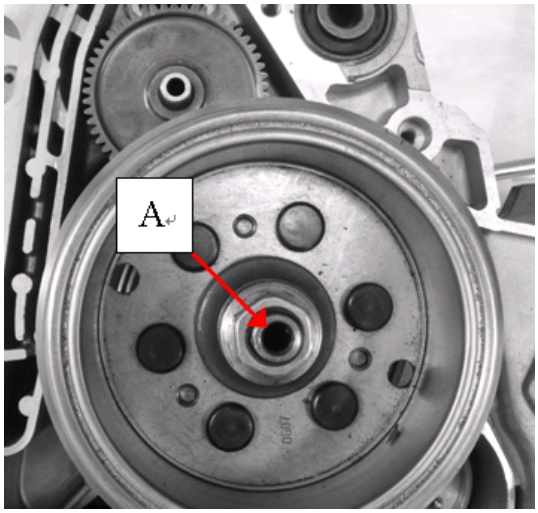
Disassemble right crank case cover gasket & pins.
Disassemble the oil through and spring.



Remove:
1. Right crank case cover gasket [A]
2. Oil through and spring [B]
3. Pins [C]

VI.OIL PUMP REMOVAL

Use the pneumatic tools disassemble the nut.



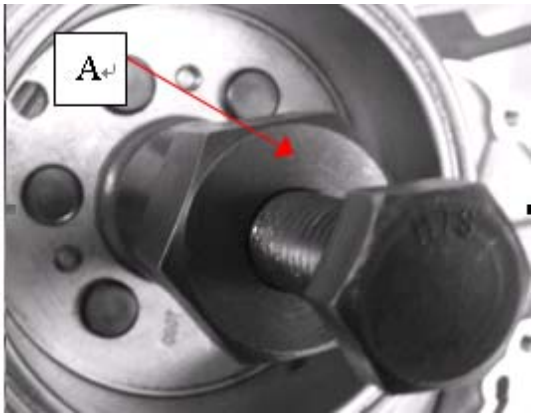
Remove:

1. Nut and washer [A]

FLYWHEEL REMOVAL

Hold the flywheel with a flywheel puller and remove the flywheel.

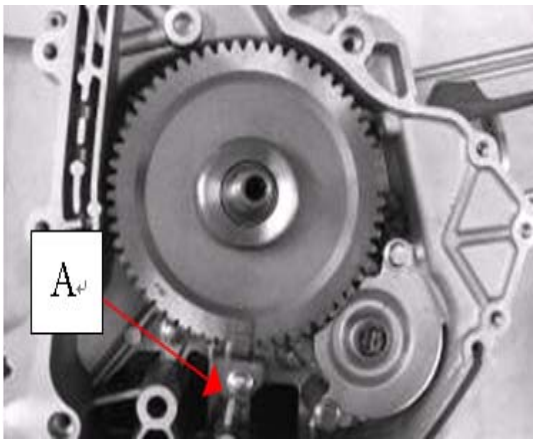
ATTENTION!!!
When work flywheel puller, it must support the A.C.G fly wheel carefully.



Remove:

1. Flywheel puller [A]

Disassemble the starter reduction gear comp.

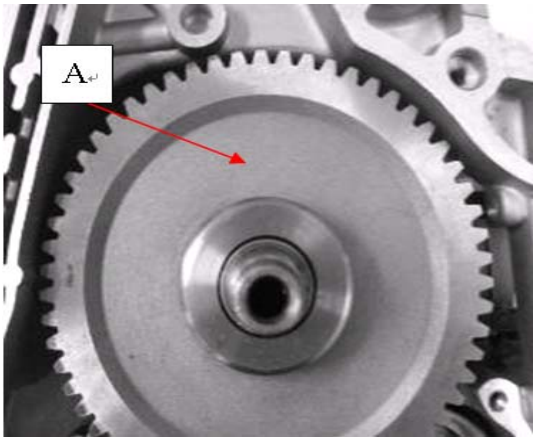


Remove:

1. Holder & bolt [A]

VI.OIL PUMP REMOVAL

Disassemble the starter driven gear comp.

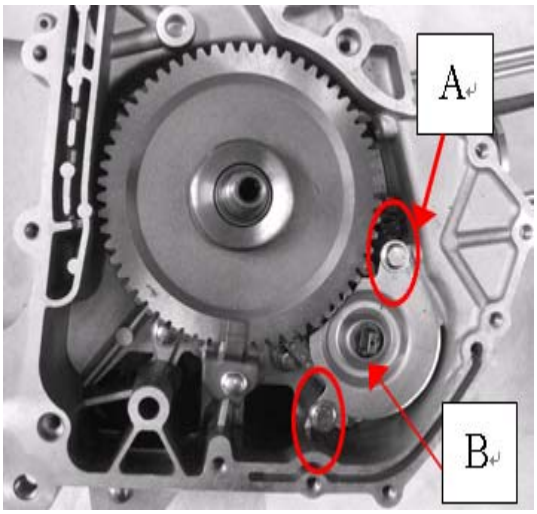


Remove:

1. Starter driven gear comp [A]

Disassemble the flange bolts.

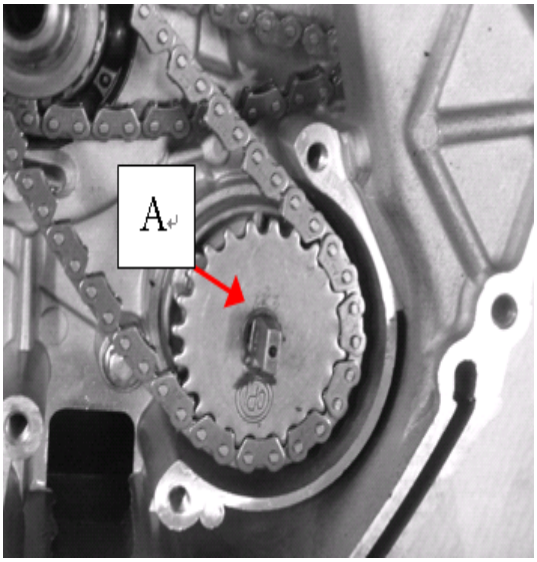
Remove the oil separator



Remove:

1. Flange bolts [A]
2. Oil separator [B]

Disassemble the Cir-clip

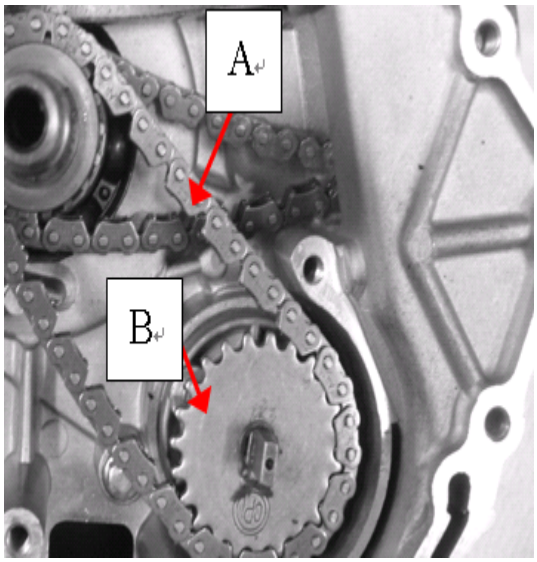


Remove:

1. Cir-clip [A]

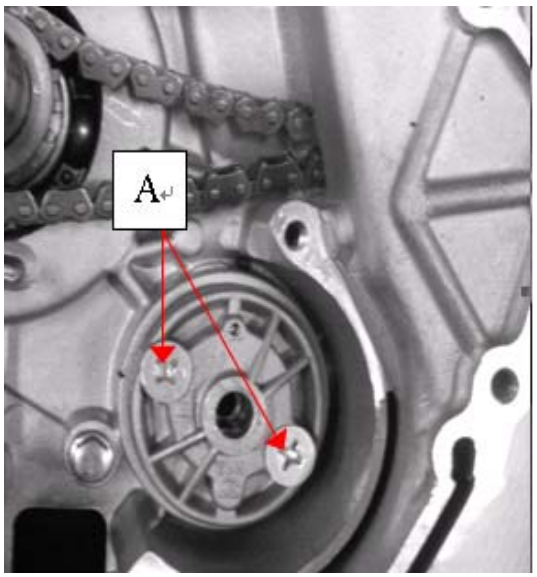
VI.OIL PUMP REMOVAL

Disassemble the oil pump chain & chain wheel.



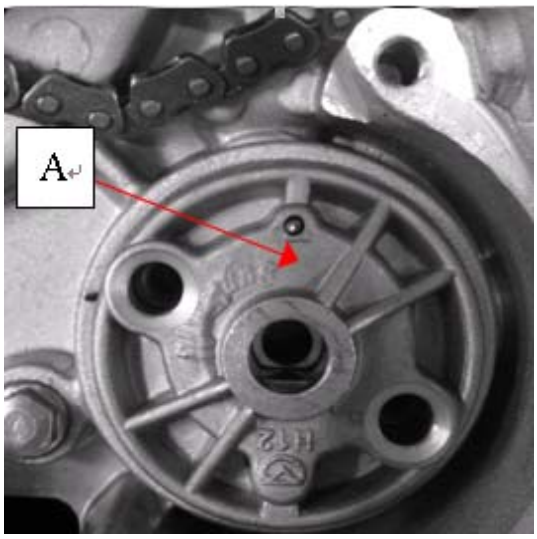
Remove:
1.Pump chain [A]
2.Chain wheel [B]

Disassemble the screws.



Remove:
1.Screws [A]

Disassemble the oil pump driven sprocket



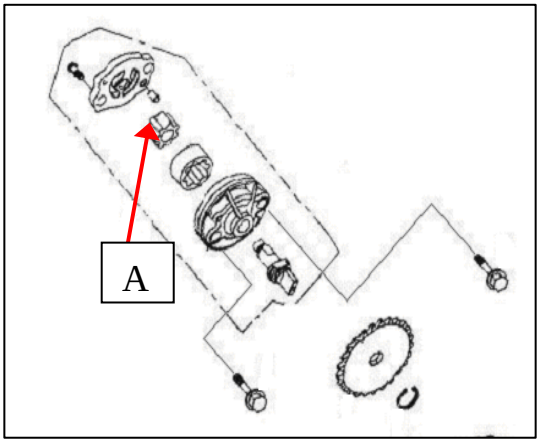
Remove:
1.Oil pump driven sprocket [A]

VI.OIL PUMP REMOVAL

OIL PUMP DISASSEMBLY

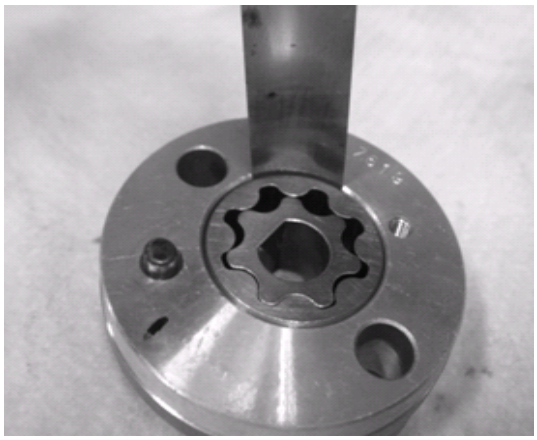
Remove the screw and disassemble the oil pump as shown

Remove:
1.Screw [A]



OIL PUMP INSPECTION

Measure the body-to-outer rotor clearance.
Service limit: 0.25 ㎜ replace if over.

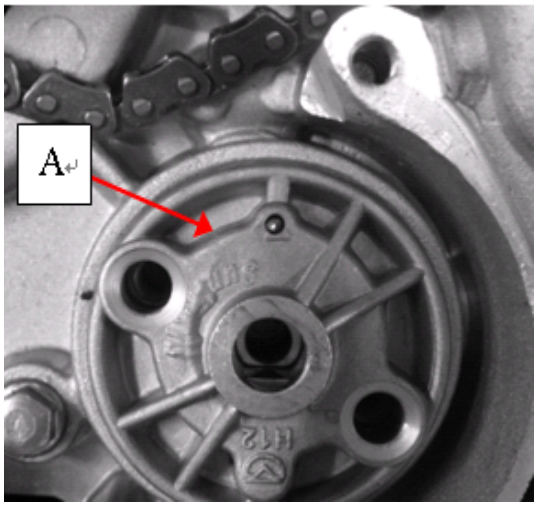


Measure the rotor end-to-pump body clearance.
Service limit: 0.12 ㎜ replace if over.

VI.OIL PUMP REMOVAL

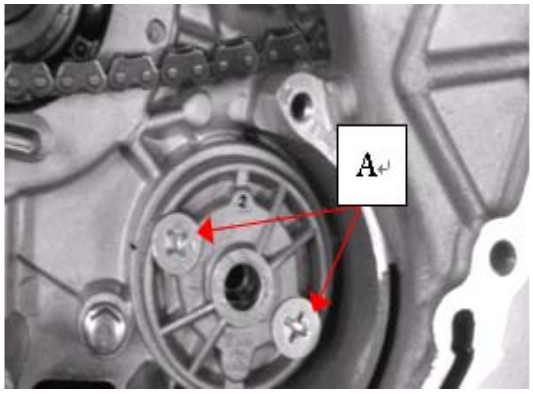
OIL PUMP INSTALLATION

Install the oil pump to the crankcase.
Install:
1.Oil pump [A]



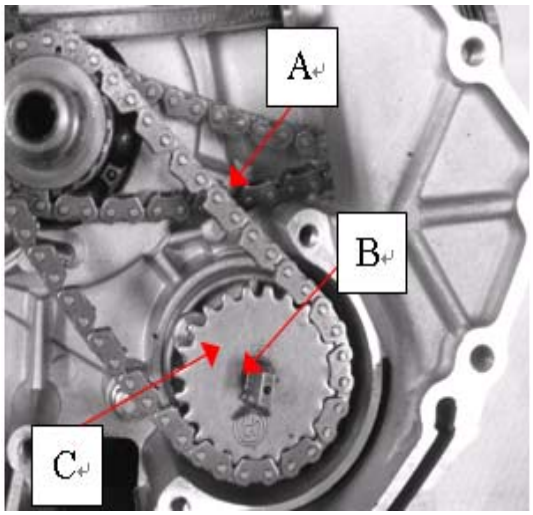
Install the oil pump and oil separator and tighten the two screws.
Make sure that the pump shaft rotates freely

Install:
1.Screws [A].



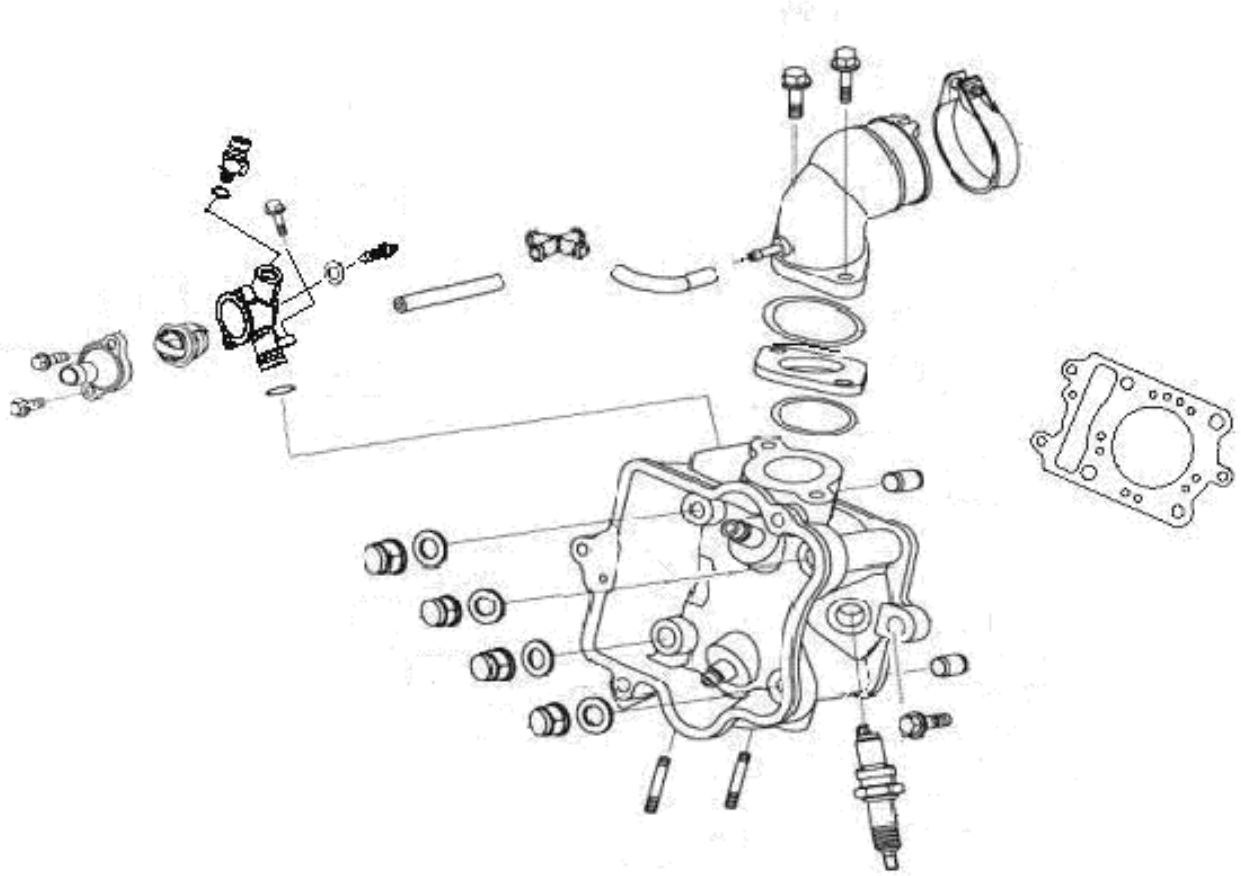
Install the pump drive chain and driven gear, then set the cir-clip securely on the pump shaft.

Install:
1.Pump chain [A]
2.Cir-clip [B]
3.Pump chain wheel [C]



VII.CYLINDER HEAD & CAM SHAFT REMOVAL

CYLINDER HEAD EXPLODED VIEW



VII.CYLINDER HEAD & CAM SHAFT REMOVAL

SERVICE INFORMATION

GENERAL INSTRUCTIONS

The cylinder head can be serviced with the engine installed in the frame. Coolant in the radiator and water jacket must be drained first.
When assembling, apply molybdenum disulfide grease or engine oil to the valve guide movable parts and valve arm sliding surfaces for initial lubrication.
The valve rocker arms are lubricated by engine oil through the cylinder head engine oil passages.
Clean and unclog the oil passages before assembling the cylinder head.
After disassembly, clean the removed parts and dry them with compressed air before inspection.
After removal, mark and arrange the removed parts in order. When assembling, install them in the reverse order of removal.

SPECIFICATIONS		Standard (mm)	Service Limit (mm)
Valve clearance(cold)	IN	0.06	---
	EX	0.08	---
Cylinder head compression pressure		12±2 kg/cm2	---
Cylinder head warpage		---	0.05
Camshaft cam height	IN	26.540	26.142
	EX	26.050	25.651
Valve rocker arm I.D.	IN	10.000~10.018	10.100
	EX	10.000~10.018	10.100
Valve rocker arm shaft O.D.	IN	9.972~9.987	9.9
	EX	9.972~9.987	9.9
Valve seat width	IN	1.000	1.600
	EX	1.000	1.600
Valve stem O.D.	IN	4.990~4.975	4.925
	EX	4.970~4.955	4.915
Valve guide I.D.	IN	5.00~5.012	5.03
	EX	5.00~5.012	5.03

VII.CYLINDER HEAD & CAM SHAFT REMOVAL

TROUBLESHOOTING
The poor cylinder head operation can be diagnosed by a compression test or by tracing engine top-end noises.

POOR PERFORMANCE AT IDLE SPEED
Compression too low

COMPRESSION TOO LOW
Incorrect valve clearance adjustment Abnormal noise
Burned or bend valves
Incorrect valve timing
Broken valve spring
Poor valve and seat contact
Leaking cylinder head gasket
Warped or cracked cylinder head
Poorly installed spark plug

ABNORMAL NOISE
Incorrect valve clearance adjustment
Sticking valve or broken valve spring
Damaged or worn camshaft
Worn cam chain tensioner
Worn camshaft and rocker arm
Warped or cracked cylinder head
Poorly installed spark plug

COMPRESSION TOO HIGH
Excessive carbon build-up in combustion chamber

TORQUE

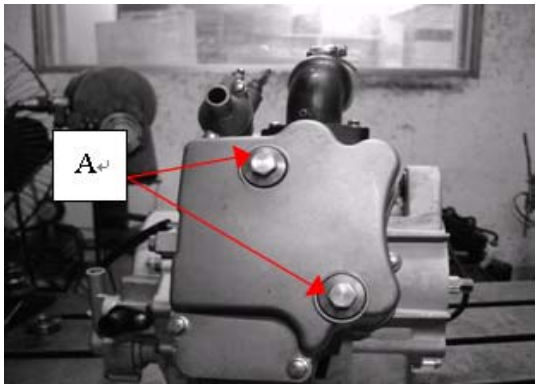
CYLINDER HEAD NUT	2.0~2.4kgf-m	TAPPET ADJUSTING NUT	0.7~1.1kgf-m
CYLINDER HEAD COVER BOLT	1.0~1.4kgf-m	PLUG	1.0~1.2kgf-m
CAM CHAIN WHEEL BOLT	1.0~1.4kgf-m		

VII.CYLINDER HEAD & CAM SHAFT REMOVAL

CAMSHAFT REMOVAL

Remove the cylinder head cover bolts.

Remove the cylinder head cover.

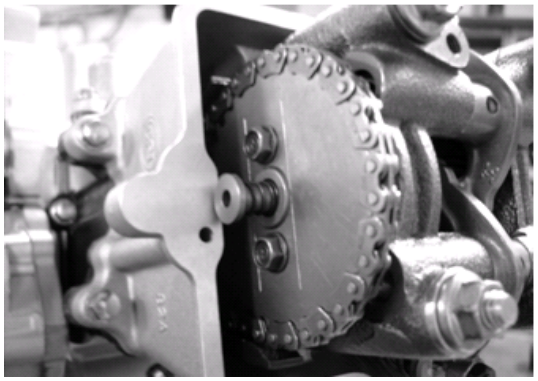


Remove:

1. Remove two cylinder head bolts. [A]

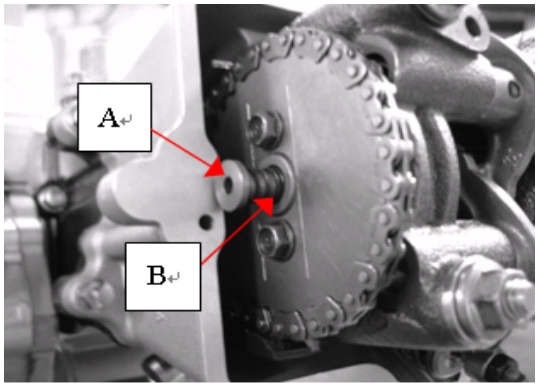
Turn the A.C. generator flywheel so that the “I” mark on the flywheel aligns with the index mark on the crankcase.

Make sure two parallel lines on cam shaft chain wheel are paralleled with cylinder head surface. Meanwhile, make sure the position is at the top dead center of the compression stroke.



Remove the oil plug , oil plug spring.

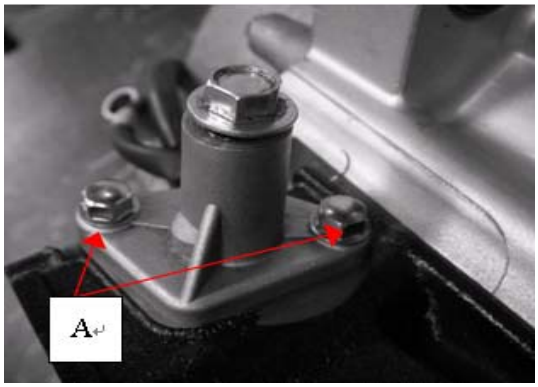
Remove two cam shaft chain wheel bolts.



Remove:

1. Oil through set[A]
2. Flange bolts [B]

Remove the two flange bolts.

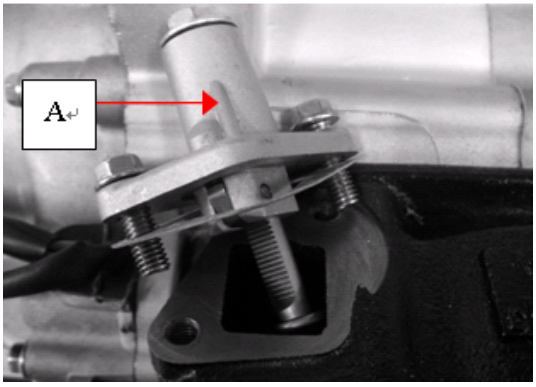


Remove:

1. Flange bolts [A]

VII.CYLINDER HEAD & CAM SHAFT REMOVAL

Disassemble the tensioner lifter comp & tensioner lifter gasket.



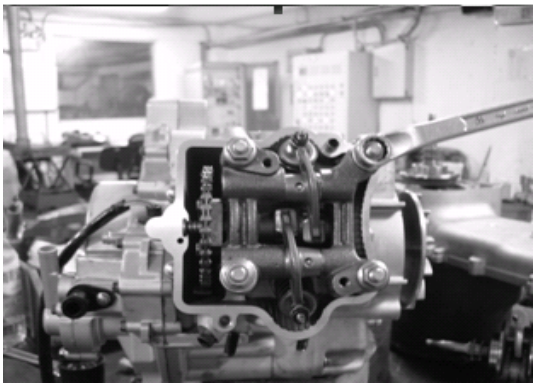
Remove:

1. Tensioner lifter comp. [A]

Disassemble the screw and spring.

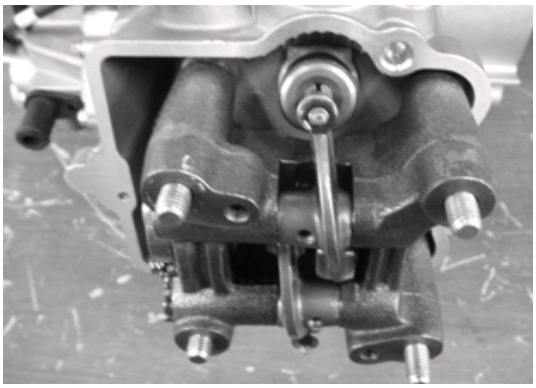
NOTE
Be careful of the missing for the o-ring on the screw.

First drain the coolant from the radiator and water jacket.
Disassemble the four flange nuts & washers of cam shaft holder.



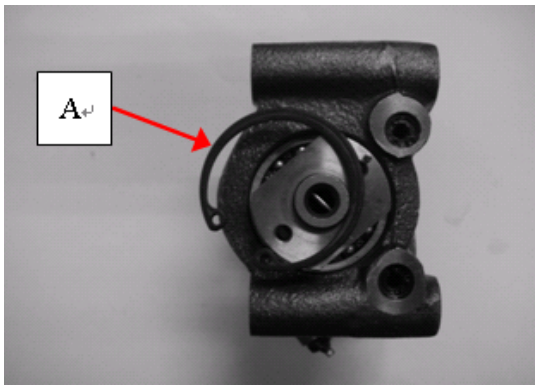
NOTE
Diagonally loosen the cylinder head flange nuts in 2 or 3 times.

Loosen the screws and take out the cam shaft.
Disassemble the dowel pins.



VII.CYLINDER HEAD & CAM SHAFT REMOVAL

Remove the Cir-clip

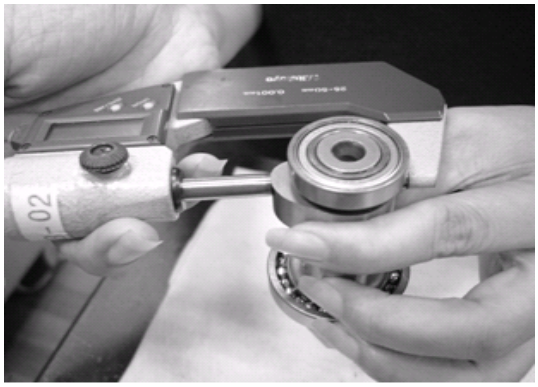


Remove:
1. Cir-clip [A]

Take out the camshaft from the cam shaft holder.

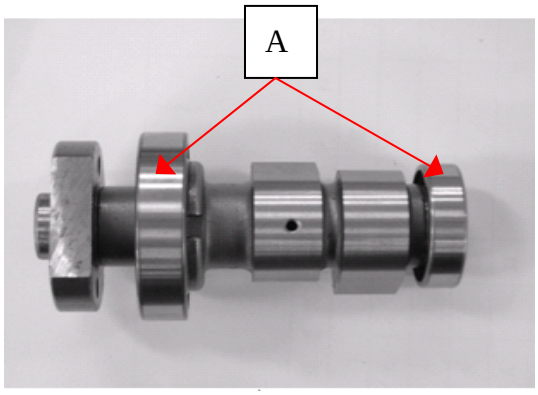
Inspection camshaft

Check each cam lobe for wear or damage.
Measure the cam lobe height.



SERVICE LIMITS:
IN : 30.69 ㎜
EX : 30.28 ㎜

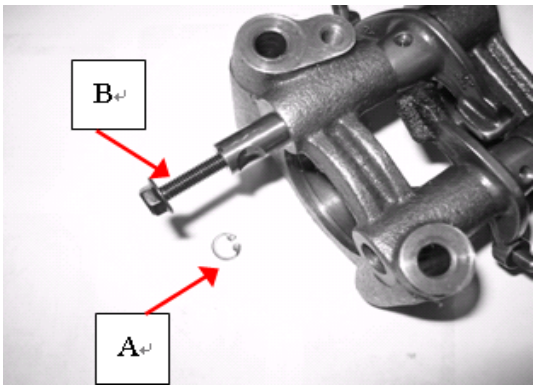
Check each camshaft bearing for play or damage.
Replace the camshaft assembly with a new one if the bearings are noisy or have excessive play.



INSPECTION:
1. BEARINGS [A]

VII.CYLINDER HEAD & CAM SHAFT REMOVAL

CAM SHAFT HOLDER DISASSEMBLY

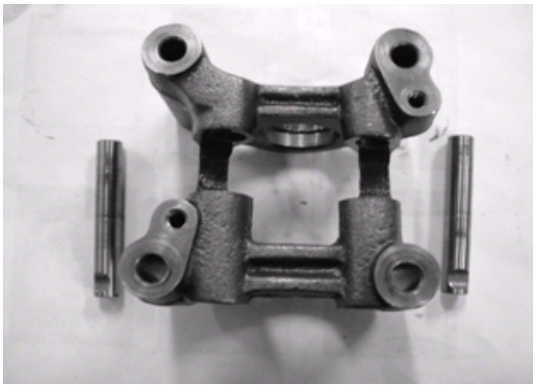


Disassemble the rocker arm cir-clip.
Disassemble the two rocker arms by using a M5 bolt.

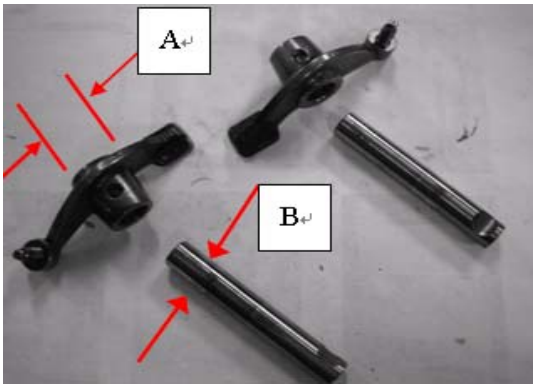
Remove:
1. Cir-clip [A]

NOTE
M5 bolt [B]

Inspect the holder, rocker arm shaft is damaged or broken.



NOTE
If the valve rocker arm contact surface is worn, check each cam lobe for wear or damage.



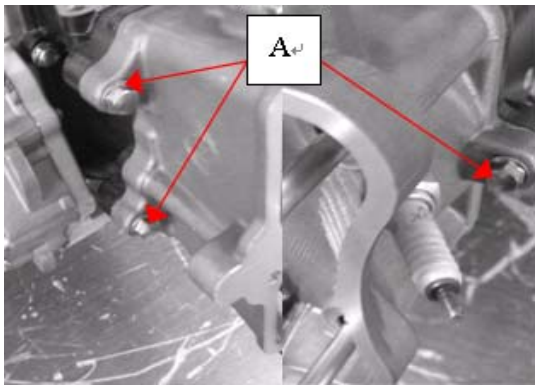
Measure the I.D. of each valve rocker arm. [A]
Service Limits: IN: 10.10mm replace if over
EX: 10.10mm replace if over

Measure each rocker arm shaft O.D. [B]
Service Limits: IN: 9.90mm replace if below
EX: 9.90mm replace if below

VII.CYLINDER HEAD & CAM SHAFT REMOVAL

CYLINDER HEAD REMOVAL

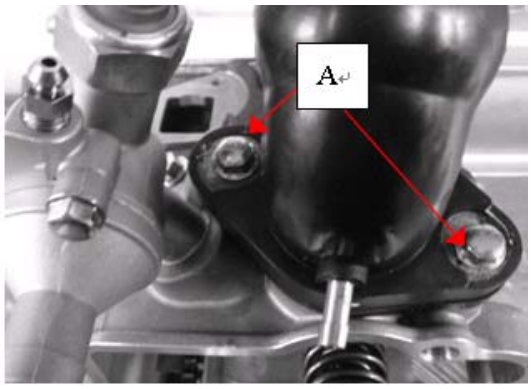
Remove three flange bolts cylinder head.



Remove:

1. Flange bolts [A]

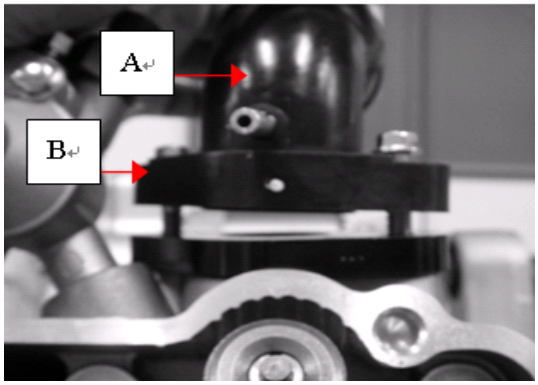
Remove two intake pipe bolts.



Remove:

1. Flange bolts. [A]

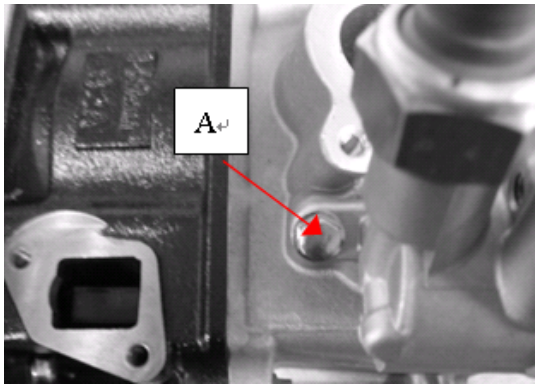
Remove the intake pipe comp. & carburetor insulator.



Remove:

1. Intake pipe comp. [A]
2. Carburetor insulator [B]

Remove the flange bolt.

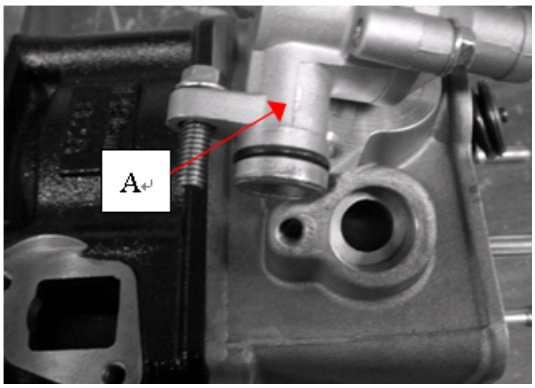


Remove:

1. Flange bolt.[A]

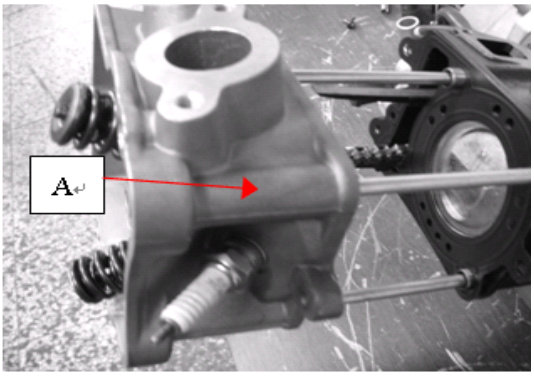
VII.CYLINDER HEAD & CAM SHAFT REMOVAL

Remove the thermostat case.



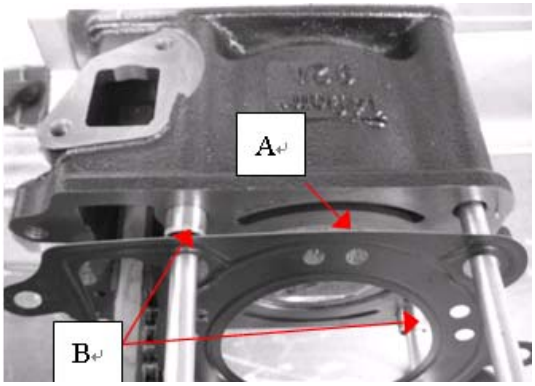
Remove:
1. Thermostat case. [A]

Remove the cylinder head assy.



Remove:
1. Cylinder head assy. [A]

Remove the dowel pins & cylinder head gasket.



Remove:
1. Cylinder head gasket. [A]
2. Dowel pins. [B]

VII.CYLINDER HEAD & CAM SHAFT REMOVAL

CYLINDER HEAD DISASSEMBLTY

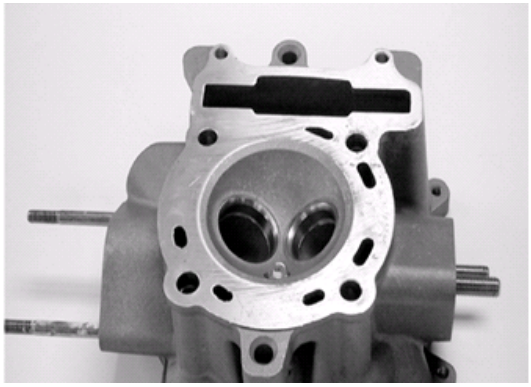
Remove the valve spring cotters, retainers, springs, spring seats and valve stem seals using a valve spring compressor.

NOTE
Be sure to compress the valve springs with a valve spring compressor. Mark all disassembled parts to ensure correct reassembly.

INSPECTION CYLINDER HEAD

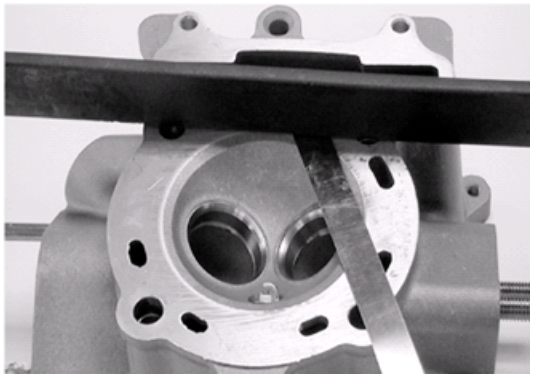
Check the spark plug hole and valve areas for cracks.

NOTE
Be careful not to damage the cylinder head mating surface.



Check the cylinder head for warpage with a straight edge and feeler gauge.

Service Limit: 0.05mm repair or replace if over.



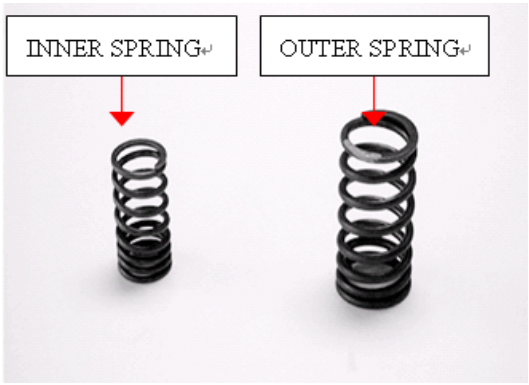
INSPECT VALVE SPRING FREE LENGTH

Measure the free length of the inner and outer valve springs.

Service Limits:

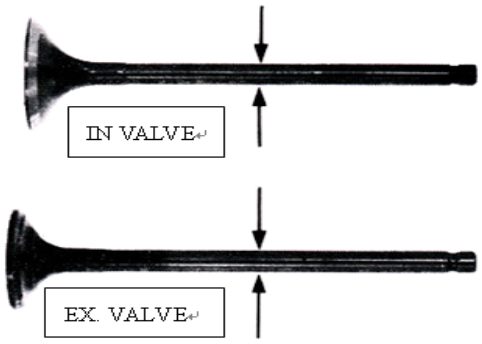
Inner (IN, EX) : mm replace if below

Outer (IN, EX): mm replace if below



VII.CYLINDER HEAD & CAM SHAFT REMOVAL

VALVE/ VALVE GUIDE INSPECT



Inspect each valve for bending, burning, scratches or abnormal stem wear.

Check valve movement in the guide.

Measure each valve stem O.D.

MEASURES :

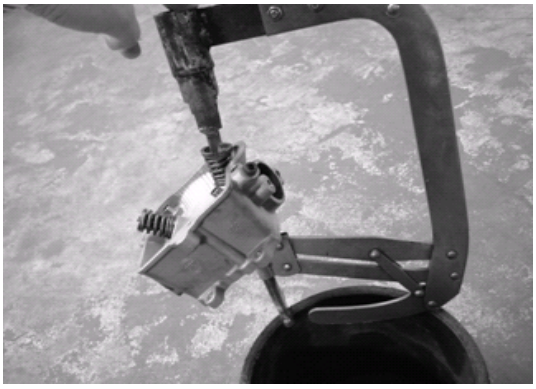
IN : 4.965 m/m replace if below

EX : 4.945 m/m replace if below

CYLINDER HEAD ASSEMBLY

Lubricate each valve stem and valve stem seal with the engine oil.

Insert the valve stem seal and valve stems into the valve guides.

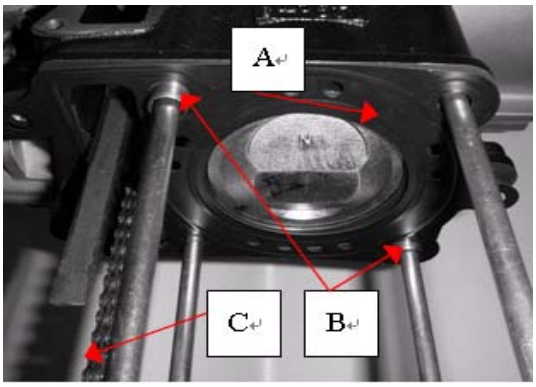


Note
Be careful not to damage the valves.

INSTALL CYLINDER HEAD

Install the cam chain guide.

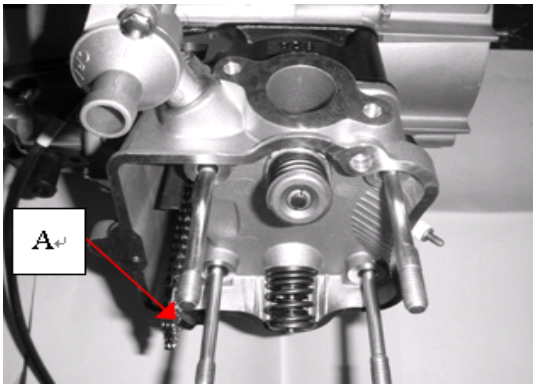
Install the dowel pins and a new cylinder head gasket.



Install:

1. CAM CHAIN GUIDE. [A]
2. Dowel pins. [B]
3. Cylinder head gasket [C]

Install the cylinder head and take out the cam chain.



Attention:

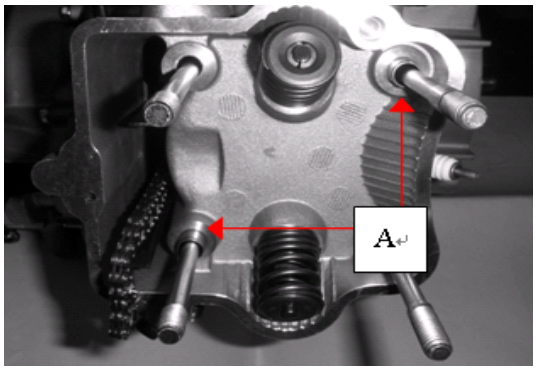
1. Cam chain [A]

VII.CYLINDER HEAD & CAM SHAFT REMOVAL

Install the dowel pins.

Install:

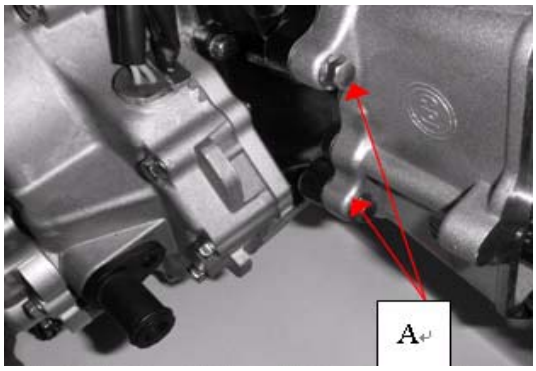
1.Dowel pins [A]

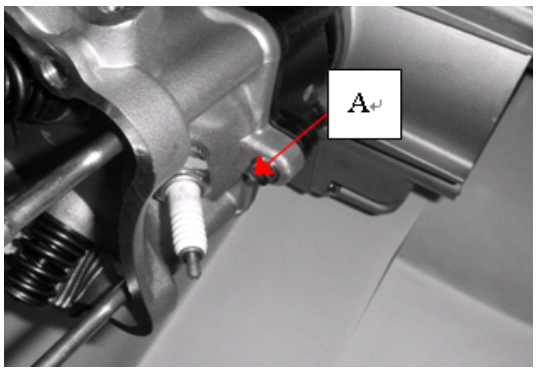


Install two sides of flange bolts on cylinder head assy.

Install:

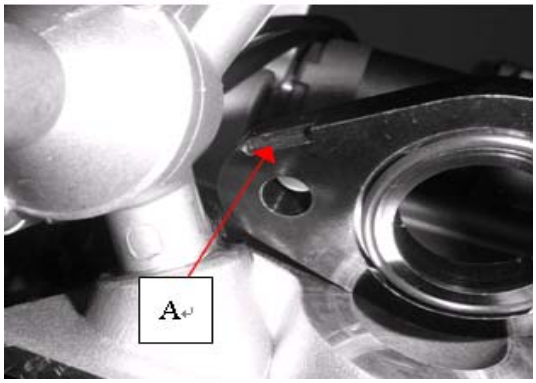
1.Flange bolts. [A]





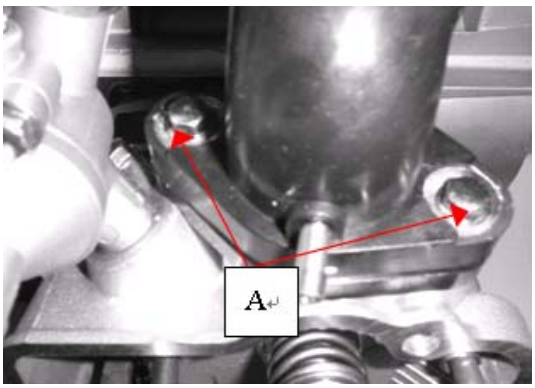
Install the carburetor heat insulator.

ATTENTION
Pay attention at direction. [A]



VII.CYLINDER HEAD & CAM SHAFT REMOVAL

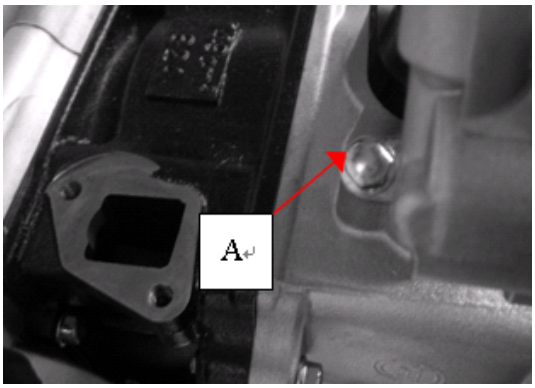
Install the intake pipe comp.



Install:

1.Flange bolts. [A]

Install thermostat comp.

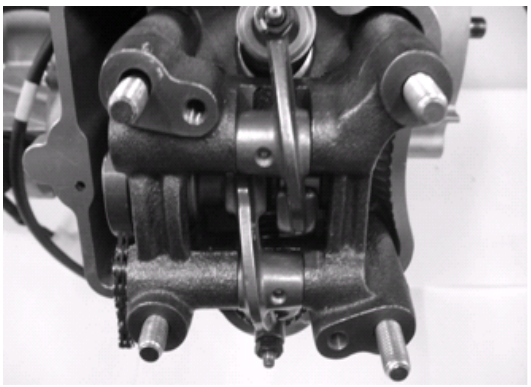


ATTENTION
Please check the thermostat comp. oil seal is damaged or broken, if yes, replaced a new one.

ASSEMBLE THE CAM SHAFT HOLDER.

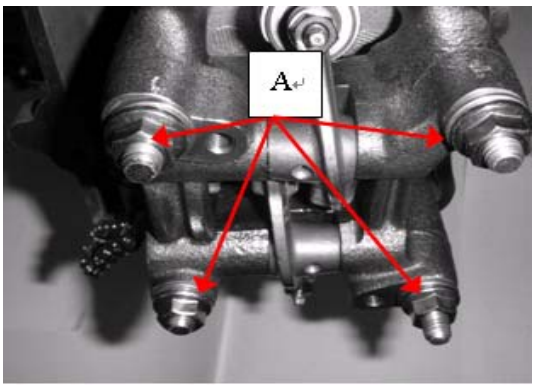
First install the intake and exhaust valve rocker arms; then install the rocker arm shafts.

Install dowel pins to cylinder head assy.



NOTE
Clean the intake valve rocker arm shaft off any grease before installation. Align the cutout on the exhaust valve rocker arm shaft with the bolt of the camshaft holder

Install washers and nuts.

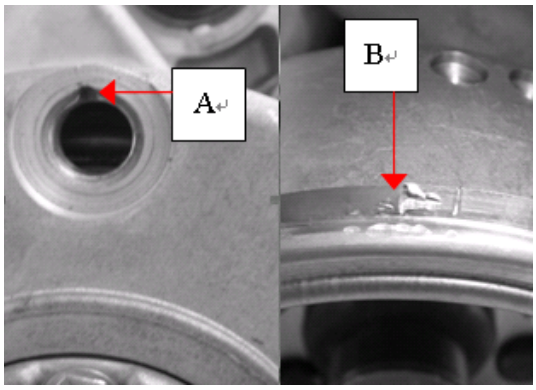


Install:

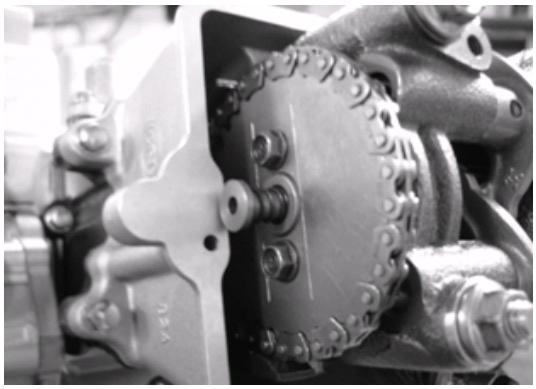
1.Washers and nuts. [A]

VII.CYLINDER HEAD & CAM SHAFT REMOVAL

Turn the A.C. generator flywheel so that the “I” mark on the flywheel aligns with the index mark on the crankcase.



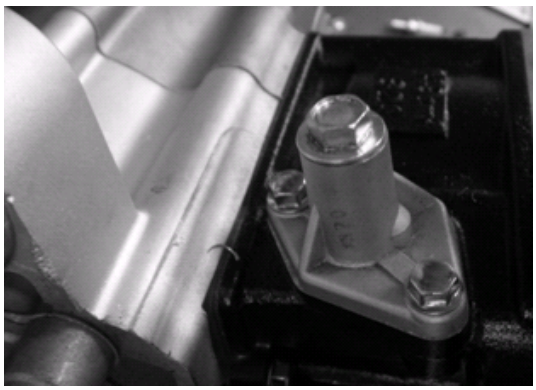
Make sure two parallel lines on cam shaft chain wheel are paralleled with cylinder head surface. Meanwhile, make sure the position is at the top dead center of the compression stroke.
Install the oil plug , oil plug spring.



Install the tension device.

CHECK
Before assembly, the tensioner device must check if the tension device gasket is broken. Before assembly, the tensioner device is pressed to the top.

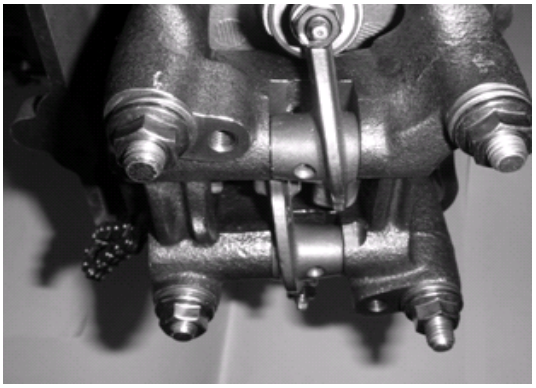
Install the screw.



CHECK
Make sure to put tensioner lifter spring and o-ring into tensioner.

VII.CYLINDER HEAD & CAM SHAFT REMOVAL

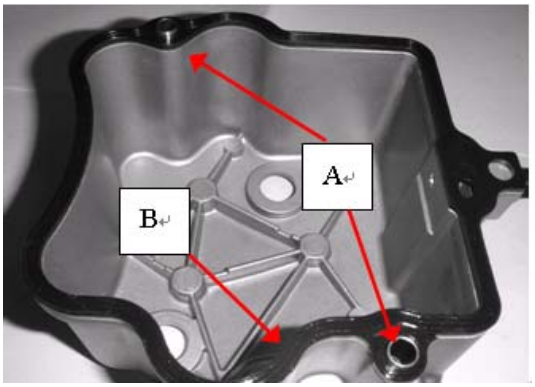
LOOSEN THE TAPPET ADJUSTING NUT



Use thickness meter to measure and adjust the valve gap.
Adjusting till the standard, fix the bolt and tighten the nut.

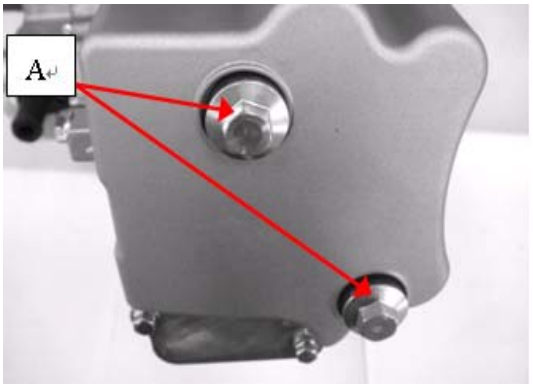
STANDARD：
In valve 0.06 mm。
Ex valve 0.08 mm。

Install the cylinder head gasket & dowel pins.



Install:
1.Dowel pins. [A]
2.Cylinder head gasket [B]

Install cylinder head cover& two special bolts.



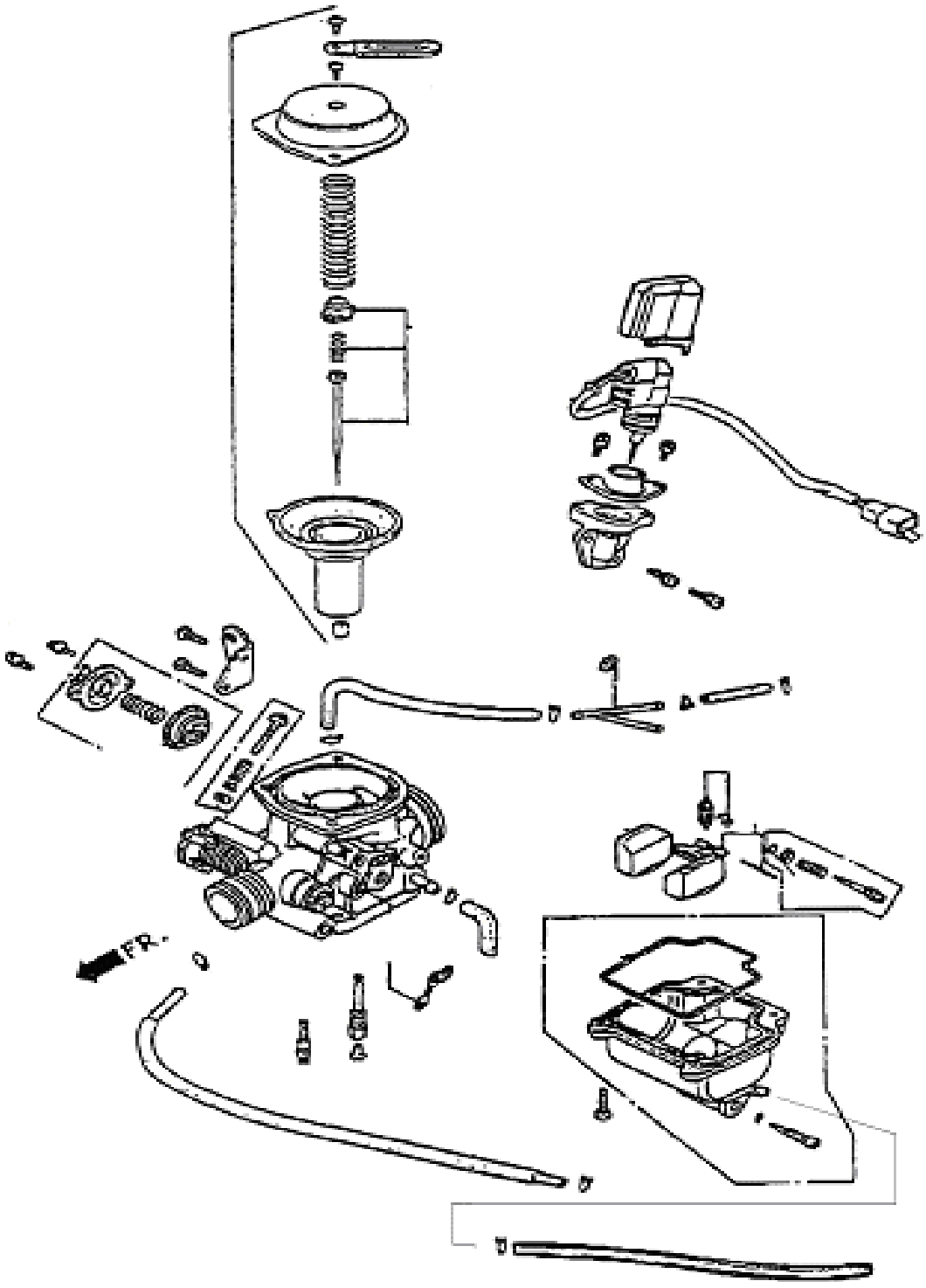
Install:
1.Special bolts [A]

VII.CYLINDER HEAD & CAM SHAFT REMOVAL

MEMO….

VIII.CARBURETOR REMOVAL

CARBURETOR EXPLODED VIEW



VIII.CARBURETOR REMOVAL

SERVICE INFORMATION

GENERAL INSTRUCTIONS

When working with gasoline, keep away from sparks and flames.

Note the locations of O-rings when disassembling and replace them with new ones during assembly.

Before float chamber disassembly, drain the residual gasoline from the float chamber.

Do not try to disassemble the auto bystarter.

When assembling the vacuum chamber and air cut-off valve, be careful not to damage the diaphragms.

All cables, fuel lines and wires must be routed and secured at correct locations.

When removing the fuel tank, keep sparks and flames away from the working area.

When removing the fuel tank, the remaining fuel in the tank must be lower than _ of the fuel tank capacity to avoid gasoline overflowing.

Fuel tank capacity: 10.5 liters

Identification number	KEIHIN 017
Venturi dia(mm)	23 mm
Float level (mm)	18 mm
Pilot screw opening	2 1/4
Main jet	#108
Slow jet	#17.5
Idle speed	1800±100
Fuel pump output	17L/H1r6/700000rpm

VIII.CARBURETOR REMOVAL

TROUBLESHOOTING

Engine does not start
No fuel in tank
Restricted fuel line
Too much fuel getting to cylinder
Clogged air cleaner
Contaminated fuel
Faulty fuel pump

Throttle does not open fully, so engine stalls
Damaged vacuum piston diaphragm
Clogged diaphragm hole

Lean mixture
Clogged fuel jets
Clogged fuel tank cap breather hole
Clogged fuel filter
Bent, kinked or restricted fuel line
Faulty float valve
Float level too low
Faulty fuel pump or insufficient output

Engine is hard to start
No fuel in tank
Restricted fuel line
Clogged fuel strainer
Faulty fuel pump
Broken or clogged vacuum tube
Faulty or clogged charcoal canister

Lean mixture
Clogged charcoal canister
Bent, kinked or restricted fuel line
Clogged fuel strainer
Float level too low

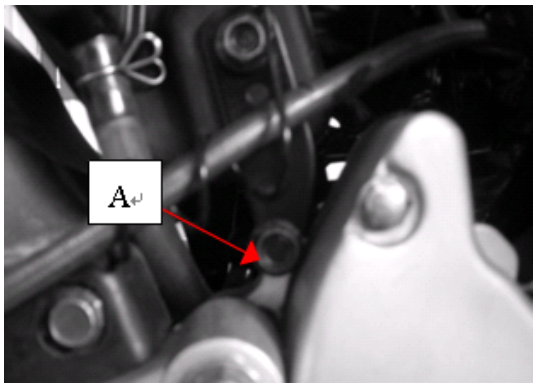
Engine idles roughly, stalls or runs poorly
Incorrect idle speed
Rich mixture
Lean mixture
Clogged air cleaner
Intake air leak
Contaminated fuel
Faulty air-cut off valve
Damaged vacuum tube and connectors
Damaged carburetor insulator

Rich mixture
Auto bystarter valve opens excessively
Faulty float valve
Float level too high
Clogged air jets
Auto bystarter valve set plate installed in the wrong groove
Clogged air cleaner

VIII.CARBURETOR REMOVAL

CARBURETOR REMOVAL

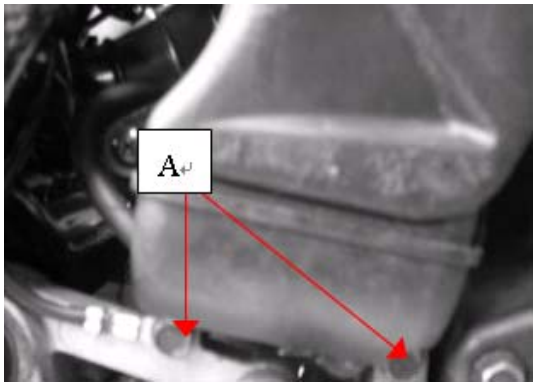
Remove the air cleaner bolt.



Remove:

1. Flange bolt [A]

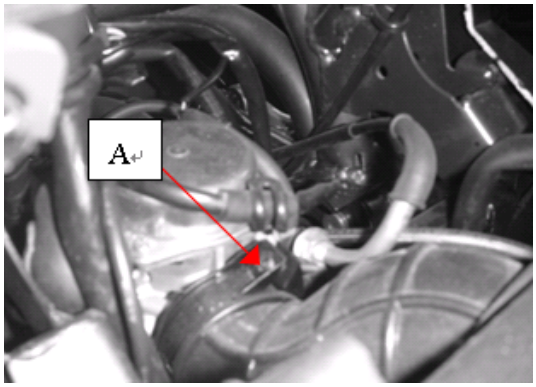
Remove air cleaner bolts.



Remove:

1. Flange bolts [A]

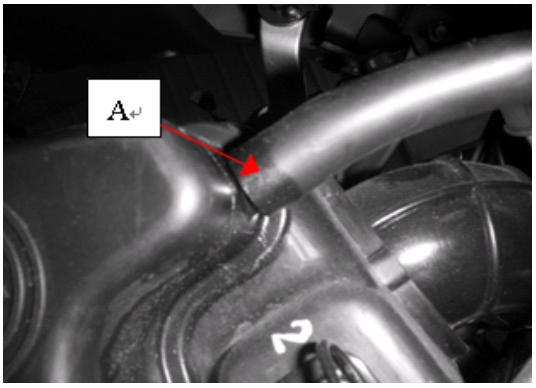
Loosen the air cleaner connection tube clamp.



Remove:

1. Clamp [A]

Remove the right crankcase breather tube.

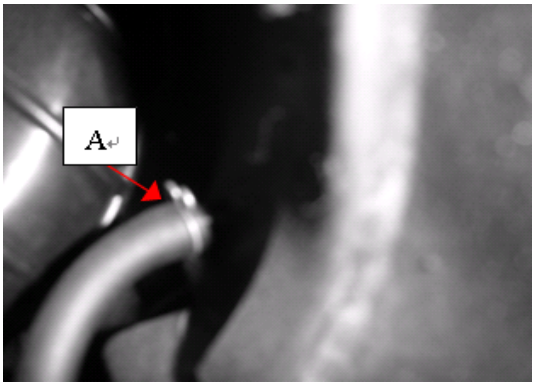


Remove:

1. Tube [A]

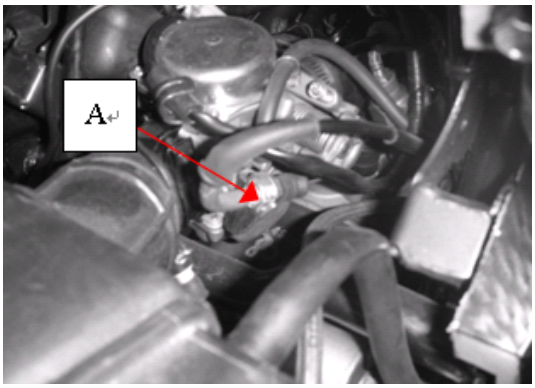
VIII.CARBURETOR REMOVAL

Remove the mission box breather tube.



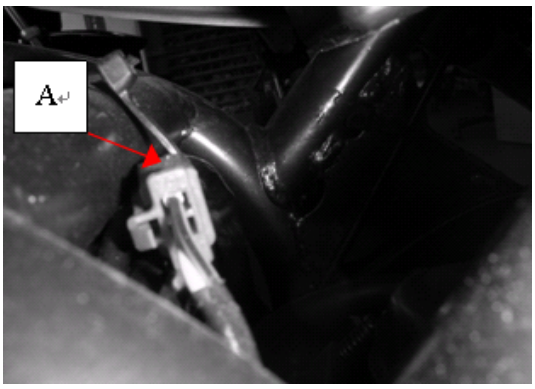
Remove:
1. Tube [A]

Loosen the throttle cable adjusting nut and lock nut, and disconnect the throttle cable from the carburetor.



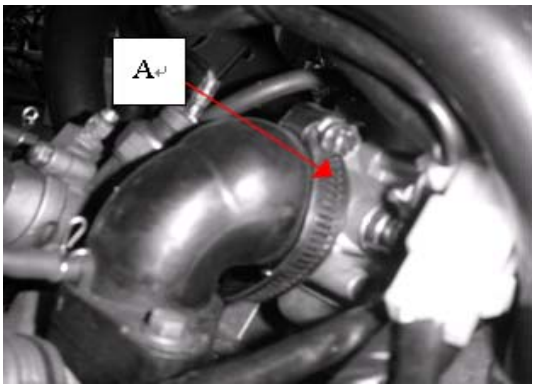
Remove:
1. Throttle Cable [A]

Disconnect the auto bystarter wire.



Remove:
1. Auto Bystarter [A]

Loosen the air cleaner connecting tube band and carburetor.



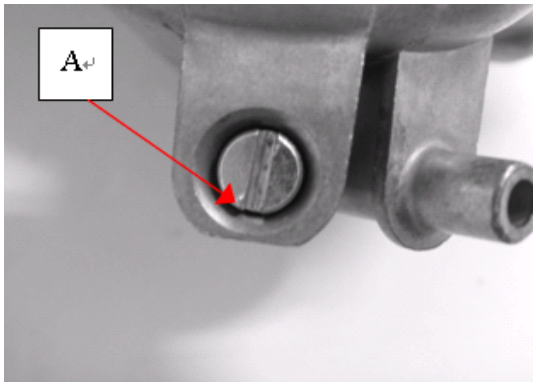
Remove:
1. Air Cleaner Connecting Tube Band [A]

VIII.CARBURETOR REMOVAL

Loosen the drain screw and drain the fuel from the float chamber.

Remove:

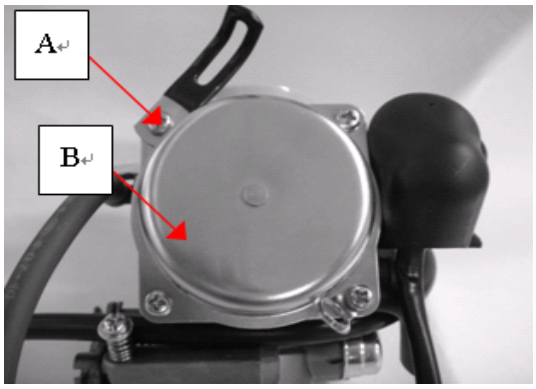
1. Drain Screw [A]



Remove the two vacuum chamber cover screws and the cover.

Remove:

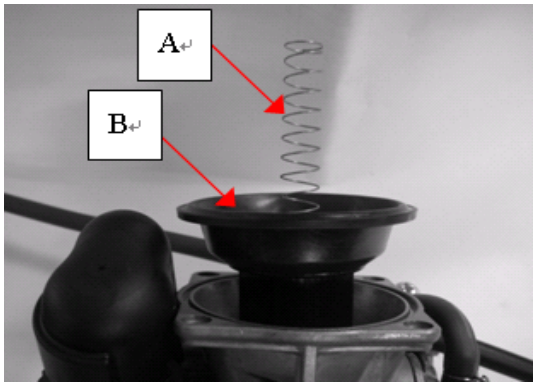
1. Screws [A]
2. Vacuum Chamber Cover [B]



Remove the compression spring and vacuum piston.

Remove:

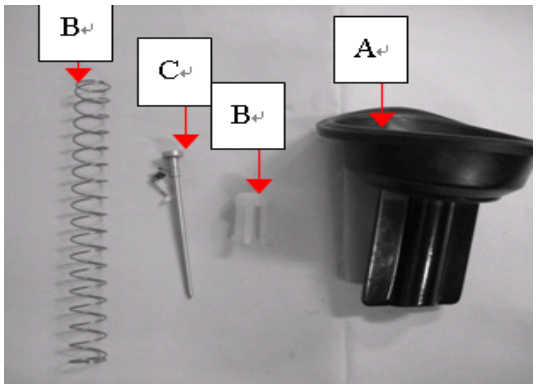
1. Spring [A]
2. Vacuum Piston [B]



Remove the needle holder, spring and jet needle from the vacuum piston.

Remove:

1. Vacuum Piston [A]
2. Needle Holder [B]
3. Jet Needle [C]
4. SPRING [D]



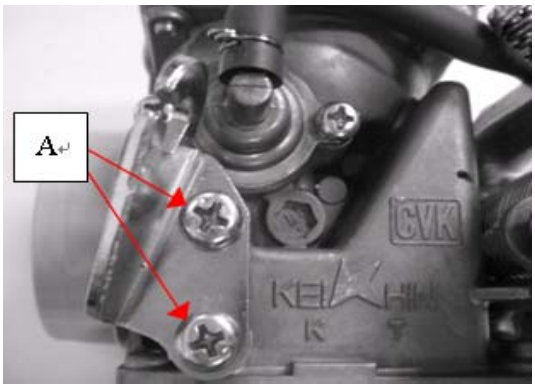
NOTE
Be careful not to damage the vacuum piston diaphragm.

VIII.CARBURETOR REMOVAL

AIR CUT-OFF VALVE INSPECTION

Inspect the vacuum piston and jet needle for wear or damage.

Inspect the diaphragm for deterioration and tears.



ACCELERATING PUMP

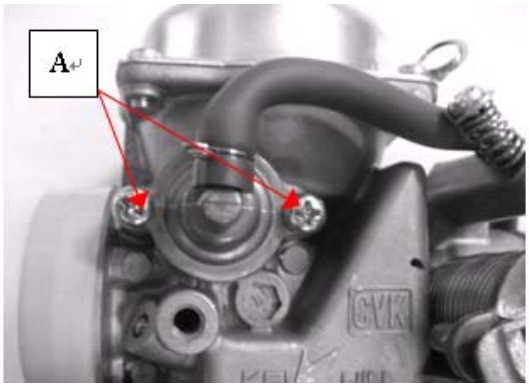
Disassemble the throttle holder screws.

Remove:

1. Screws [A]

Disassemble the two accelerating pump cover screws and accelerating pump cover.

Disassemble the spring and accelerating pump diaphragm.



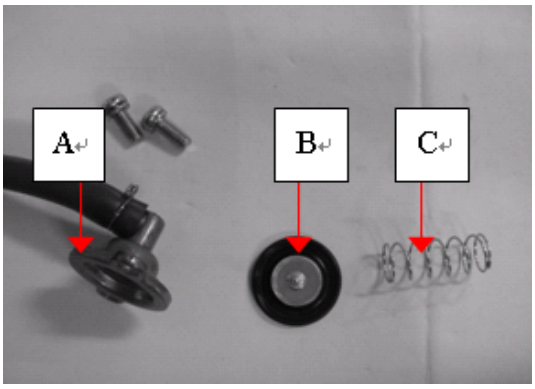
Remove:

1. Screws [A]

INSPECTION

Inspect the accelerating pump diaphragm for cracks, damage or deterioration.

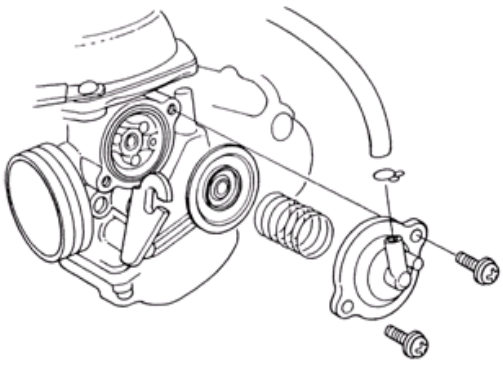
Replace if necessary.



Inspect:

1. Cover [A]
2. Diaphragm [B]
3. Spring [C]

Assemble the accelerating pump in the reverse order of disassemble



VIII.CARBURETOR REMOVAL

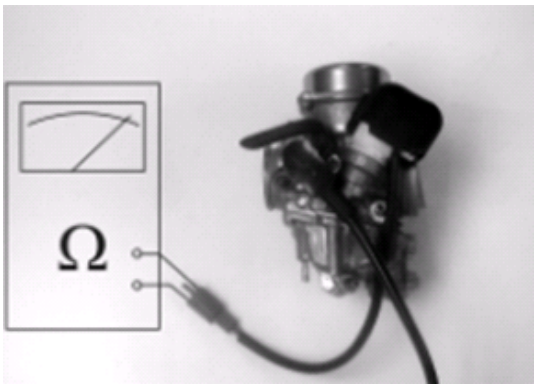
AUTO BYSTARTER INSPECTION

Measure the resistance between the auto bystarter wire terminals.

Resistance: 10

(10 minutes minimum after stopping the engine)

If the reading is not within the limit, replace the auto bystarter with a new one.

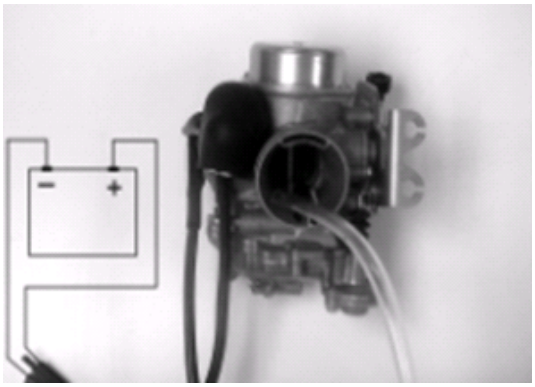


Connect a hose to the fuel enriching circuit of the carburetor.

Connect the auto bystarter green/black wire to the positive (+) terminal of a battery and black/white wire to the negative (-) terminal. Wait 5 minutes and blow the hose with mouth.

If the passage is blocked, the auto bystarter is normal.

Disconnect the auto bystarter from the battery. Wait 30 minutes and blow the hose with mouth.. If air can be blown into the hose, the auto bystarter is normal.

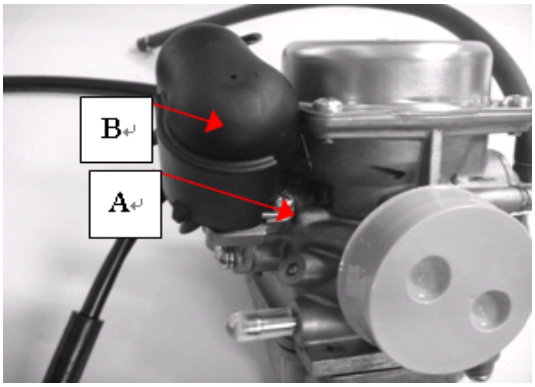


AUTO BYSTARTER REMOVAL

Remove the one set plate screw and then remove the auto bystarter from the carburetor body.

Remove:

1. Screws [A]
2. Auto Bystarter [B]



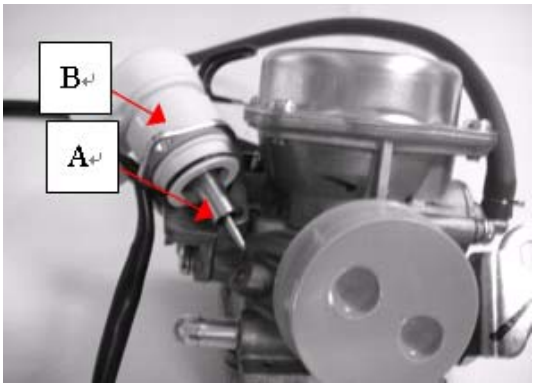
AUTO BYSTARTER INSPECTION

Check the auto bystarter valvend needle for nicks, wear or damage.

If any faulty part is found, replace the auto bystarter with a new one.

Check:

1. Bystarter Needle [A]
2. Bystarter Valve [B]

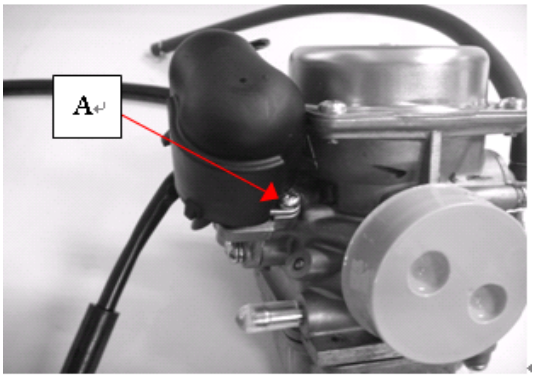


VIII.CARBURETOR REMOVAL

Install the auto bystarter.

Install:

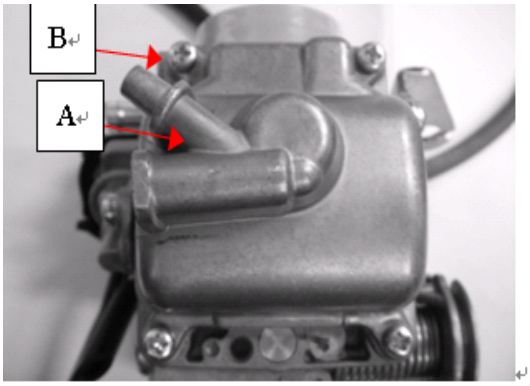
1. Screws [A]



Remove the 4 float chamber screws and the float chamber.

Remove:

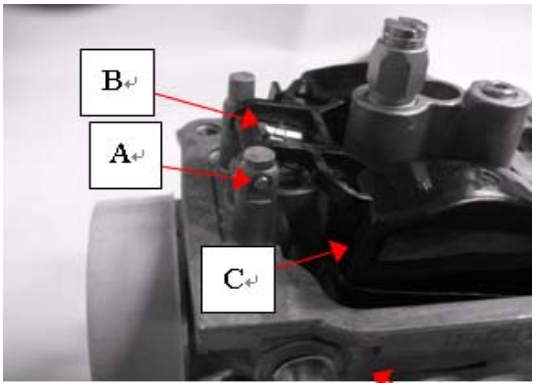
1. Screws [A]
2. Float Chamber [B]



Remove the float pin, float and float valve.

Remove:

1. Float Pin [A]
2. Float Valve [B]
3. Float [C]

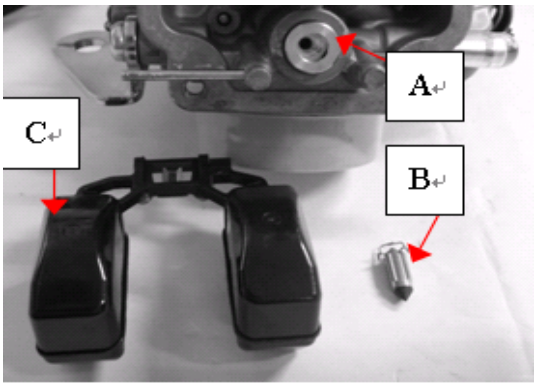


FLOAT VALVE INSPECTION

Inspect the float valve seat contact area for wear.

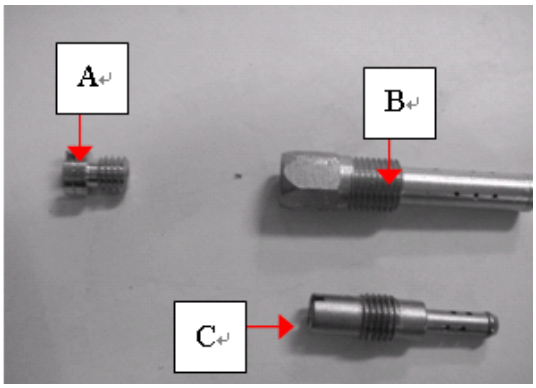
Remove:

1. Float Valve Seat [A]
2. Float Valve [B]
3. Float [C]



VIII.CARBURETOR REMOVAL

Remove the main jet, needle jet holder and idle jet.
Remove the slow jet.

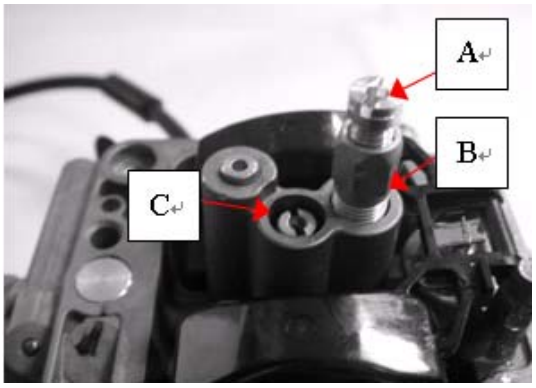


Remove:
1. Main Jet [A]
2. Needle jet holder [B]
3. Idle Jet [C]

Clean the removed the main jet, needle jet holder, needle jet and slow jet with detergent oil.

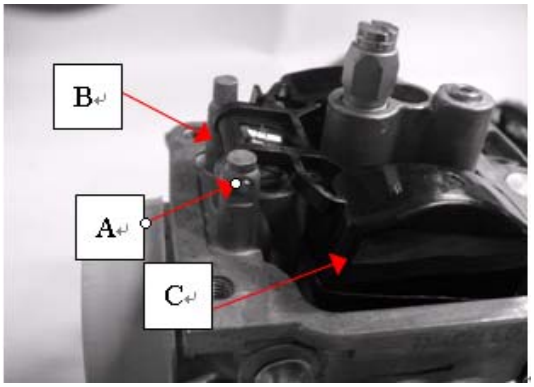
ATTENTION!!!
Be sure to use clean detergent oil.

Install the main jet、needle jet holder、idle jet.



Install
1. Main Jet [A]
2. Needle jet holder [B]
3. Idle Jet [C]

Install the float pin, float and float valve.
Install:
1. Float Pin [A]
2. Float Valve [B]
3. Float [C]

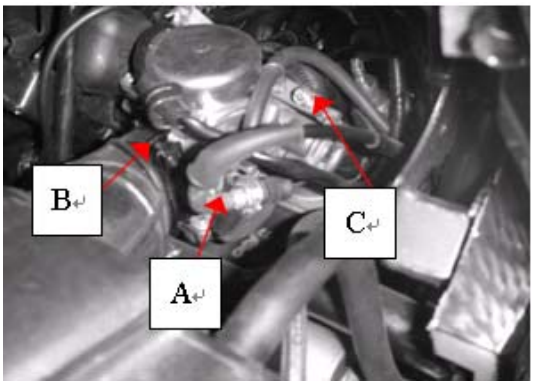


VIII.CARBURETOR REMOVAL

CARBURETOR INSTALLATION

Tighten the drain screw.

Install the carburetor onto the intake manifold and tighten the band. Install the air cleaner connecting tube and tighten the clamp.



Connect the throttle cable to the carburetor.

Install:

1. Throttle Cable [A]
2. Air Cleaner Connecting Tube clamp [B]
3. Intake Manifold Band [C]

Connect the auto bystarter wire.

Connect the fuel tube and vacuum tube to the carburetor.

Perform the following inspections and adjustments:

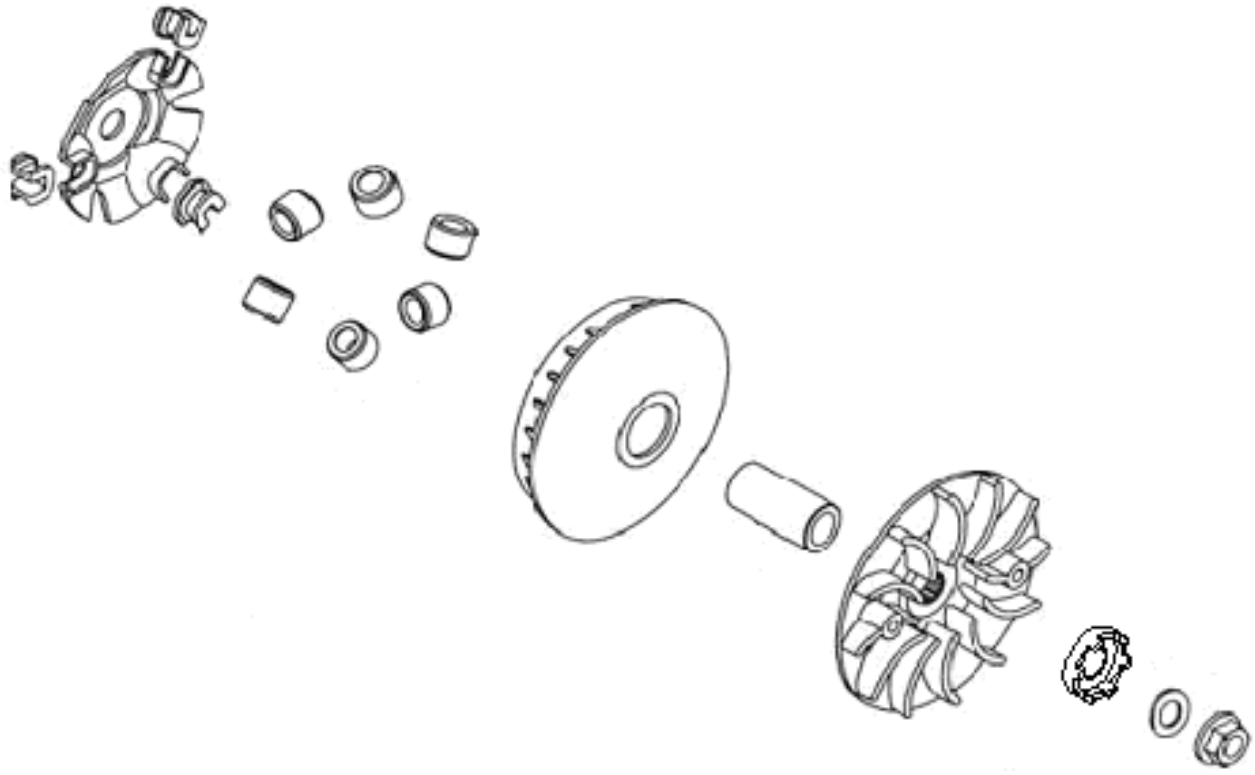
1. Throttle grip free play
2. Idle speed

VIII.CARBURETOR REMOVAL

MEMO….

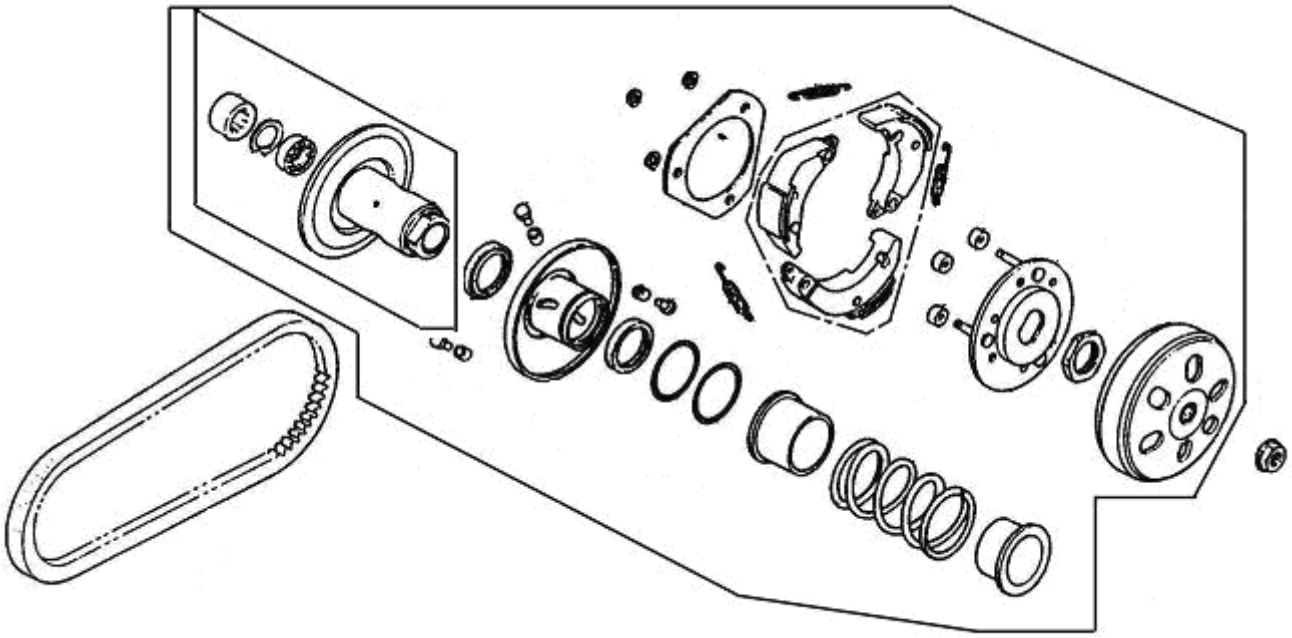
IX.DRIVE AND DRIVEN PULLEYS & KICK STARTER

DRIVE AND DRIVEN PULLEY EXPLODED VIEW.



IX.DRIVE AND DRIVEN PULLEYS & KICK STARTER

KICK STARTER EXPLODED VIEW.



IX.DRIVE AND DRIVEN PULLEYS & KICK STARTER

SERVICE INFORMATION

GENERAL INSTRUCTIONS

The drive pulley, clutch and driven pulley can be serviced with the engine installed.

Avoid any grease and oil on the drive belt and pulley faces. Make sure to clean all if there is on the part to minimize the slipping of drive belt and drive pulley.

Specification

Item	Standard	Limit
Drive belt width	19.700	18.700
Movable drive face inner diameter	23.985~24.052	24.060
Weight roller outer diameter	19.950~20.100	18.500
Driven pulley inside diameter	125.000~125.200	125.500
Driven pulley pad thickness	4.000~4.100	2.000
Driven pulley spring length	128.400	123.400
Driven pulley outer diameter	33.965~33.985	33.940
Driven pulley inside diameter	34.000~34.025	34.060

TORQUE VALUES

Clutch outer nut 5.0~6.0 kg-m

Clutch drive plate nut 5.0-6.0kg-m

IX.DRIVE AND DRIVEN PULLEYS & KICK STARTER

TROUBLESHOOTING

Engine starts but motorcycle won‘t move

Worn drive belt.

Broken ramp plate.

Worn or damaged clutch lining.

Broken driven face spring.

Engine starts or motorcycle creeps

Broken clutch weight spring

Worn drive belt Lack of power

Weak driven face spring

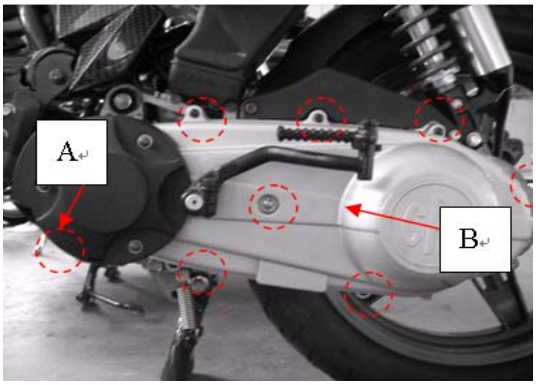
Worn weight roller

Faulty driven face

IX.DRIVE AND DRIVEN PULLEYS & KICK STARTER

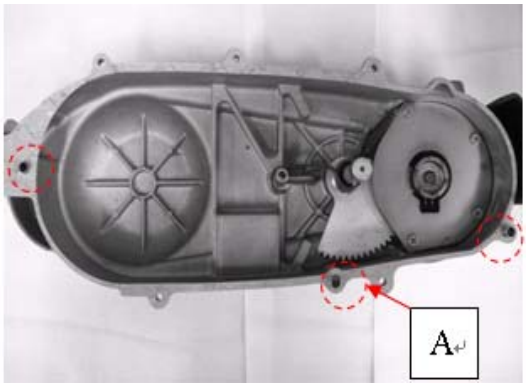
Disassemble the flange bolts.
Disassemble the Left crankcase cover.

Remove:
1. Flange bolts [A]
2. Left crank case cover [B]



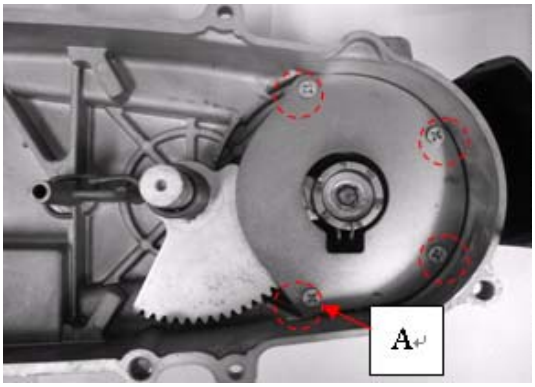
Disassemble the gasket & dowel pins.

Remove:
1. Dowel pins. [A]

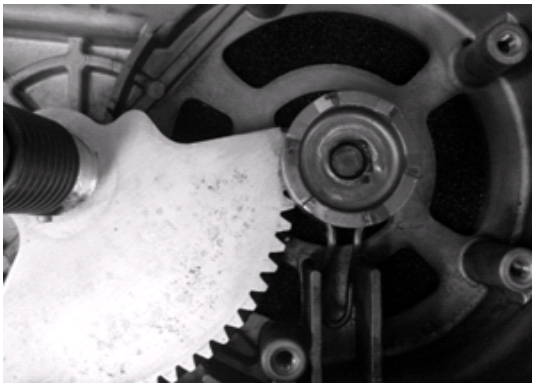


Disassemble four screws.
Disassemble the left crankcase cover plate.

Remove:
1. Screws [A]

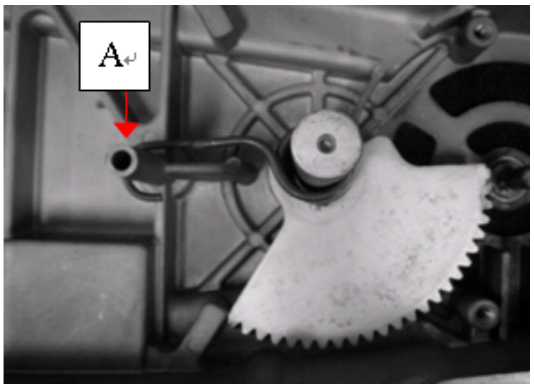


Disassemble the start idle gear comp.



IX.DRIVE AND DRIVEN PULLEYS & KICK STARTER

Disassemble the starter kick spring.



Remove:

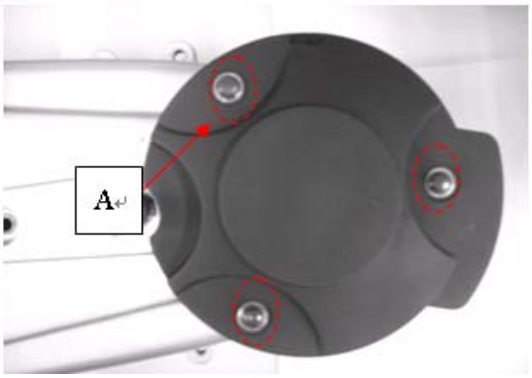
1. Starter kick spring [A]

Disassemble the starter idle gear shaft.

ATTENTION!!!
Idle gear shaft is dispensable to be disassembled.

Disassemble flange bolts.

Disassemble the shroud cover.

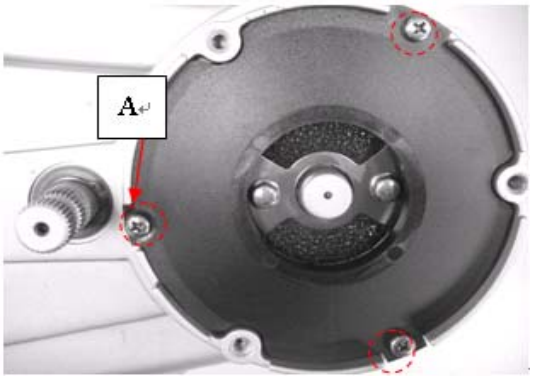


Remove:

1. Flange bolts [A]

Disassemble three screws.

Disassemble the inner cover.

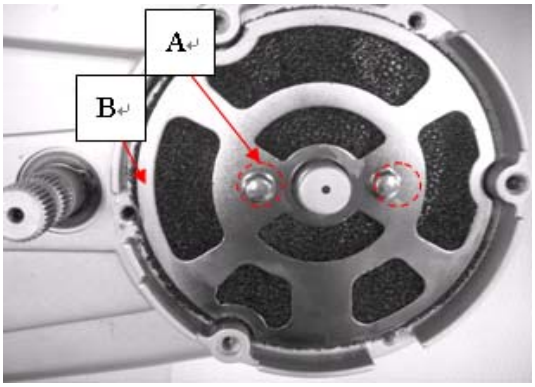


Remove:

1. Screws [A]

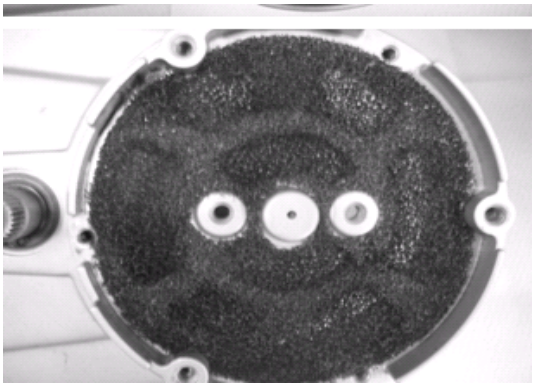
IX.DRIVE AND DRIVEN PULLEYS & KICK STARTER

Disassemble flange bolts.
Disassemble the element plate.



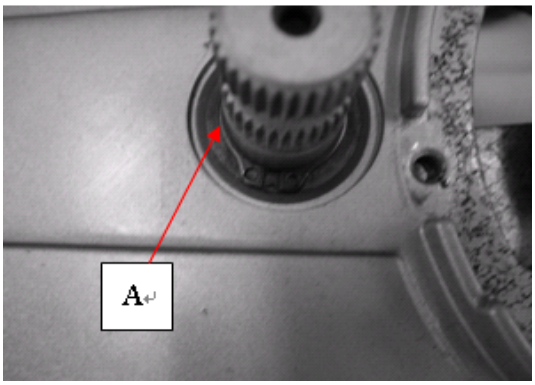
Remove:
1. Flange bolts [A]
2. Element plate [B]

Disassemble the filter.



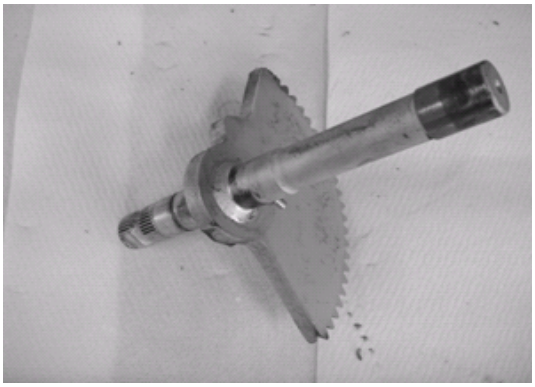
NOTE
Inspect the filter if it is dirty or damaged. If it is dirty or damage, please change a new one.

Disassemble the cir-clip & washer.



Remove:
1. Cir-clip & washer [A]

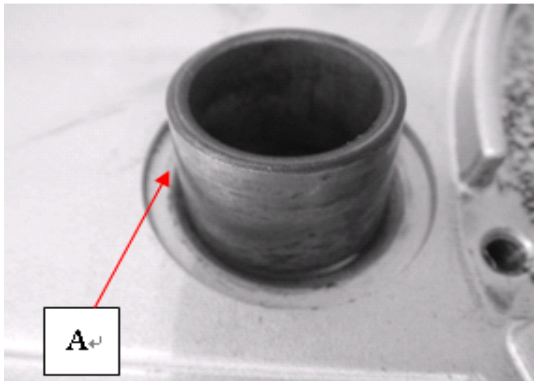
Disassemble the kick starter spindle comp.



IX.DRIVE AND DRIVEN PULLEYS & KICK STARTER

Disassemble the kick spindle bush.

Remove:
1. Bush [A]



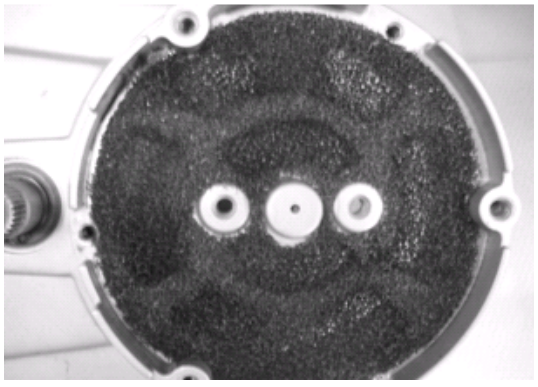
Install the kick starter comp.

Install the kick starter spindle & bush.

Install the cir-clip & washer.

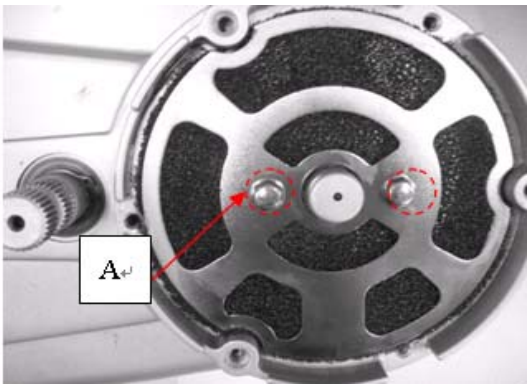
Install the filter.

NOTE
When install the filter, please check the direction.



IX.DRIVE AND DRIVEN PULLEYS & KICK STARTER

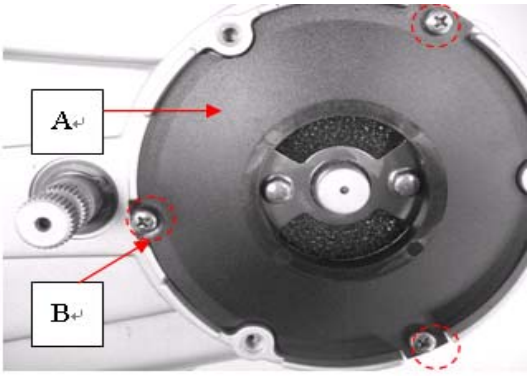
Install the element plate.
Install flange bolts.



Install:
1. Element plate [A]
2. Flange bolts [B]

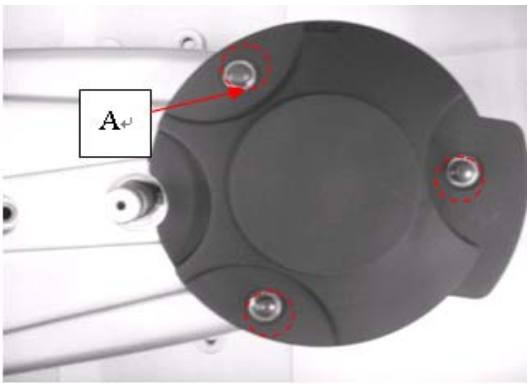
NOTE
When install the element plate, please check the direction.

Install the inner cover.
Install the screws.



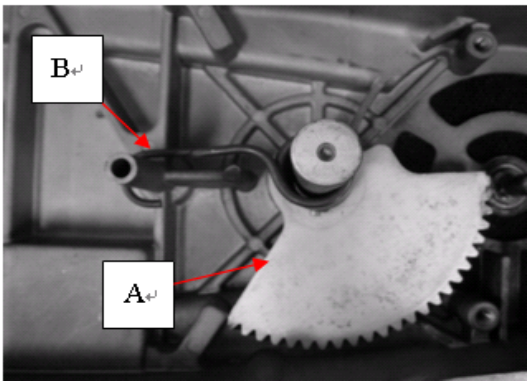
Install:
1. Inner cover [A]
2. Screws [B]

Install the shroud cover.
Install flange bolts.



Install:
1. Shroud cover [A]
2. Flange bolts [B]

Install the kick starter spindle comp.
Install the starter kick spring.

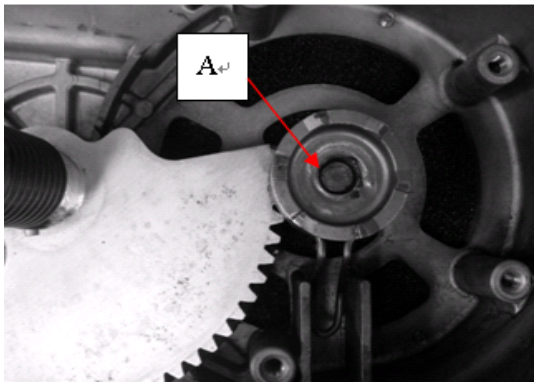


IX.DRIVE AND DRIVEN PULLEYS & KICK STARTER

INSTALL THE STARTER IDLE GEAR COMP.

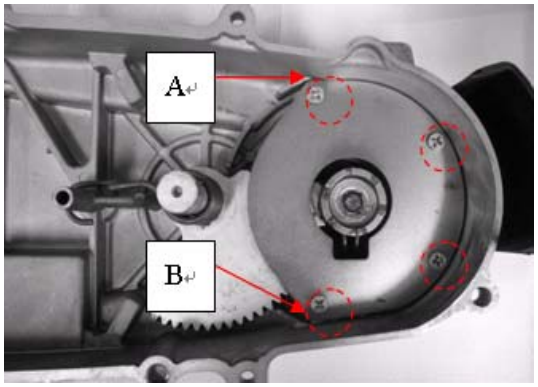
Install:

1. Idle gear comp.[A]



Install the left crankcase cover plate.

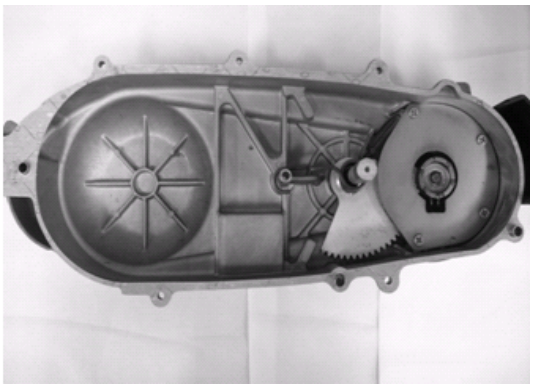
Install the screws



Install:

1. Left crankcase cover plate [A]
2. Screws [B]

Install the gasket & dowel pins

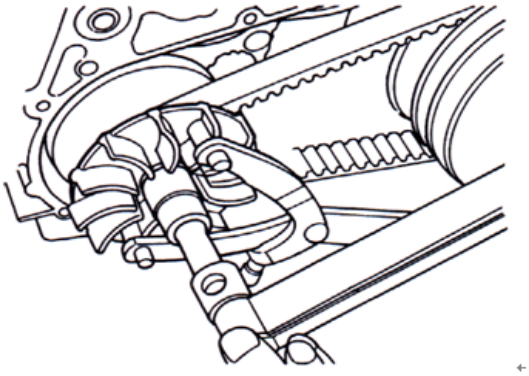


ATTENTION!!!
The gasket needed to change new one.

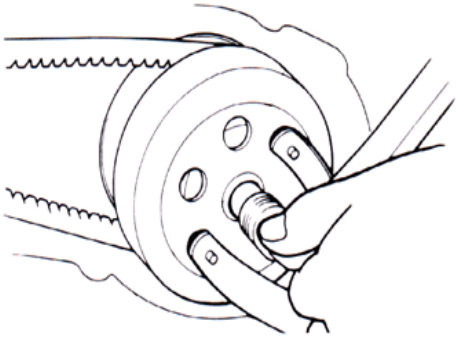
IX.DRIVE AND DRIVEN PULLEYS & KICK STARTER

Remove drive belt.

Using the multi-Installing(Y shape Installed tool) clip to install the driven face, disassemble the nut, washer ad drive face.

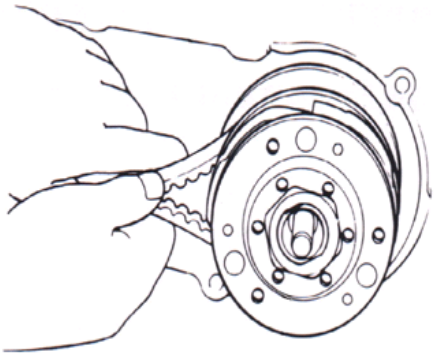


Using the multi-Installing clip (Y shape Installing tool) to install the driven pulley outer then remove the nut and driven pulley outer.

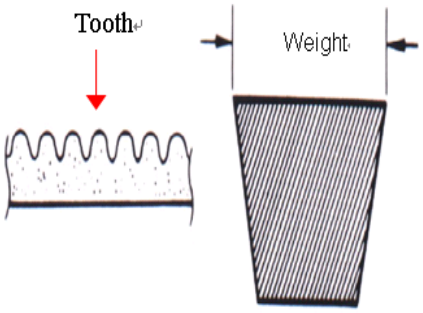


DRIVEN BELT INSPECT

Put drive belt into driven pulley groove (same as the picture) make ir loosen,then take out belt and driven pulley together. Disassamble the belt from groove.



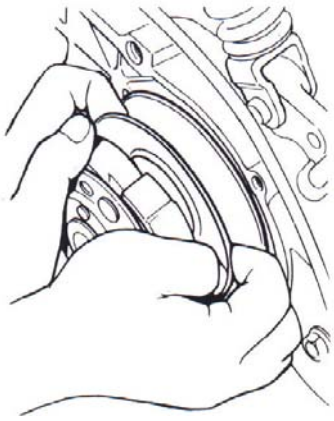
Inspect the belt for crack wear damage.
Measure the width of belt
SERVICE LIMIT : 20.7mm



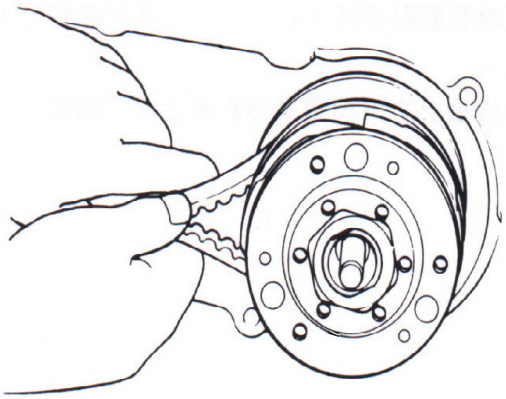
IX.DRIVE AND DRIVEN PULLEYS & KICK STARTER

INSTALL DRIVEN ASSY.

Put apart the drive pulley, then install the drive belt into the drive pulley.

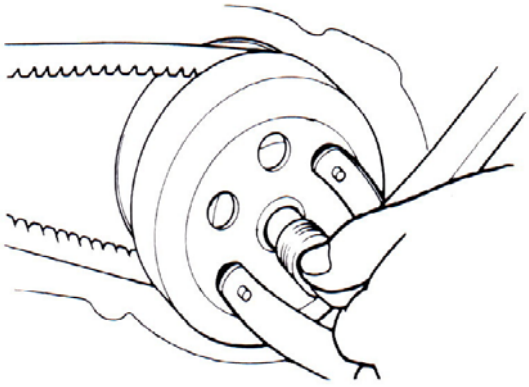


Install the driven pulley assy. with drive belt to the drive shaft. Assemble another side of drive belt to movable drive face.



Install the driven pulley assy. outer.
Using the multi-Installing tool(“Y” shape tool) to install the driven pulley assy. outer and tighten the nut by standard torque.

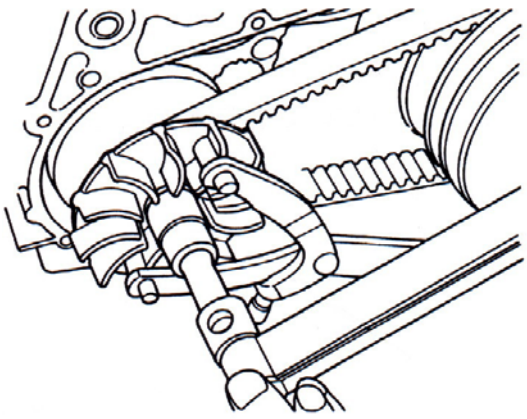
Torque：5.0~6.0kgf-m



Install the movable drive face, washer & nut.
Using the multi-Installing tool (“Y” shape tool) to install the drive face.

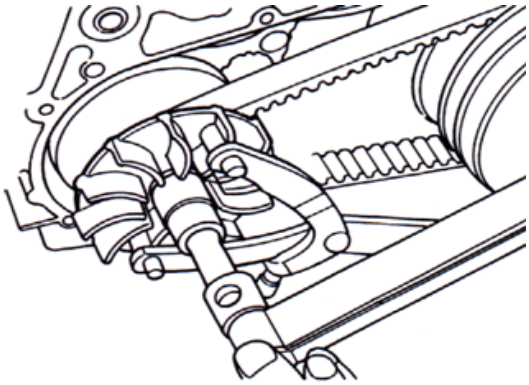
PAY ATTENTION!!!
It must be no any grease on both sides of drive face, use grease stripper to clean the unnecessary grease.

Torque：5.0~6.0kgf-m



IX.DRIVE AND DRIVEN PULLEYS & KICK STARTER

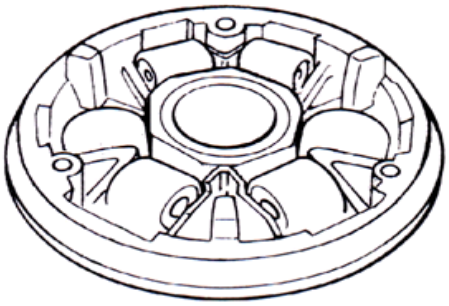
INSPECT MPVABLE DRIVE FACE



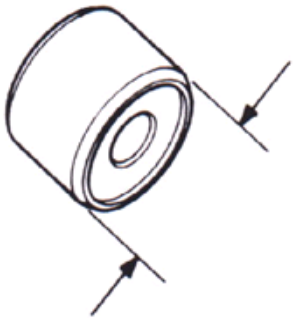
Disassemble the left crankcase cover.
Using the multi-Installing tool (“Y” shape tool) to Install the driven pulley, disassemble the nut & washer. And take away the drive face and the drive belt.

Disassemble the movable drive face comp. & drive face boss from crank.

Remove the ramp plate.
Disassemble the weight roller from movable drive face comp.

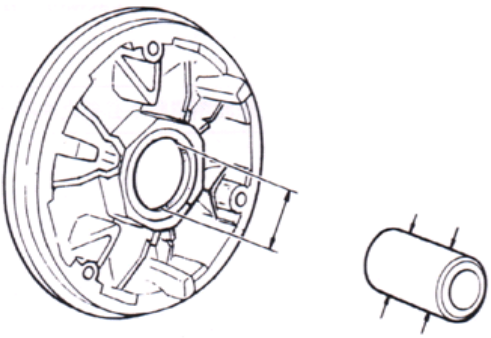


CHECK
Measure weight roller if damage or wear.



Service limits：19mm

The function of movable drive face comp. is to use the centrifugation of weight roller to roll per angle of ramp plate in order to move the drive face for speed changing. So if weight roller is worm or centrifugatio from weight rollers. Therefore the outer diameter of weight roller shorld be checked per stadard and replace them if necessary.



Measure drive face boss if damage or wear.
Service limits： 23.8mm

Check the outer diameter of drive face boss if it is damaged or worm. Replace for new part if necessary.

IX.DRIVE AND DRIVEN PULLEYS & KICK STARTER

Measure drive face I.D.

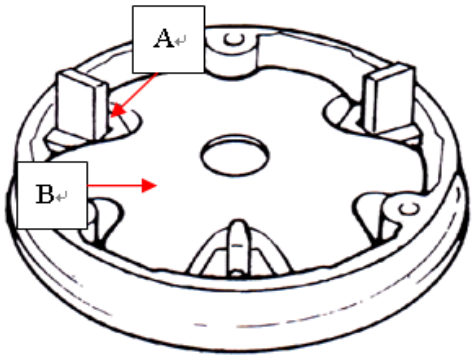
Measure the inner diameter of movable drive face. Replace for new if necessary.

Install weight roller.

NOTE
There are 2 different sides of weight roller, in order to extend the part life ad avoid the extraordinary worm, please put close side of weight roller on movable drive face by anticlockwise direction.

Install the three slide pieces to ramp plate.

Install the ramp plate.

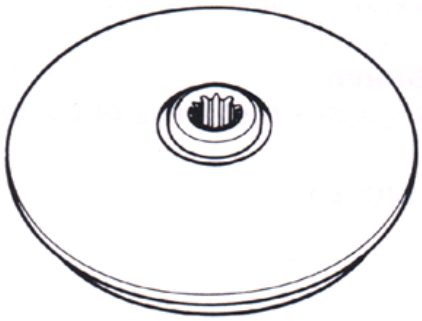


Install:

1. Slide pieces [A]
2. Ramp plate [B]

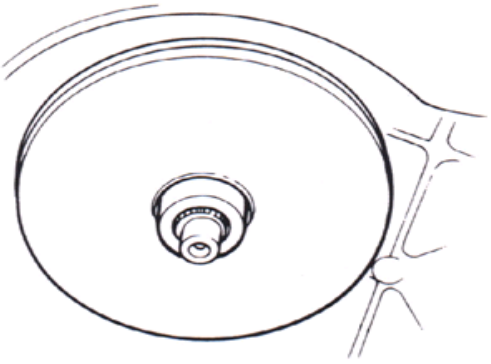
Smear a little grease inside of drive face shaft hole.

Install the drive face boss.



ATTENTION!!!
It can not have any grease on belt and surface of drive face, it can use grease stripper to clean the unnecessary grease.

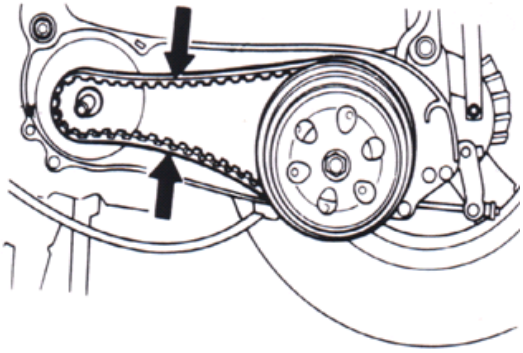
Install drive face comp. to crankshaft.



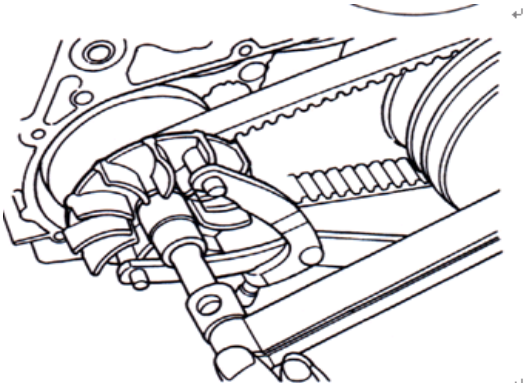
IX.DRIVE AND DRIVEN PULLEYS & KICK STARTER

DRIVE FACE ASSEMBLY

Install drive belt to drive face

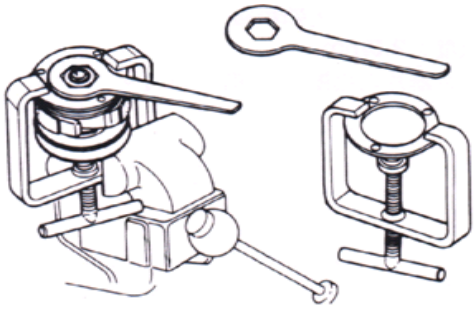


Tighten up per torque standard.
Torque：5.0~6.0kgf-m

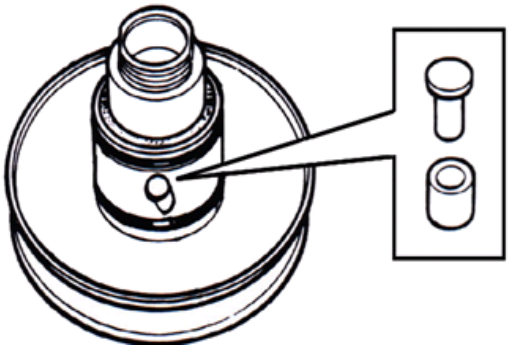


DISASSEMBLY DRIVEN PULLEY ASSY.

Disassemble the drive face and driven pulley assy.
Install the clutch spring condenser to driven pulley assy. then tighten it for fitting with nut easily.
Per picture to put the clutch spring condenser on vise and use special wrench dismount the nut.
Loosen the driven pulley spring condenser, disassemble the driven pulley and spring from drive face.
Dismount the oil seal cover from drive face.



Dismount the oil seal cover from driven face assy.
Disassemble the guide pin, roller guide pin & movable driver face, dismount the O-ring and oil seal gasket from driver face.

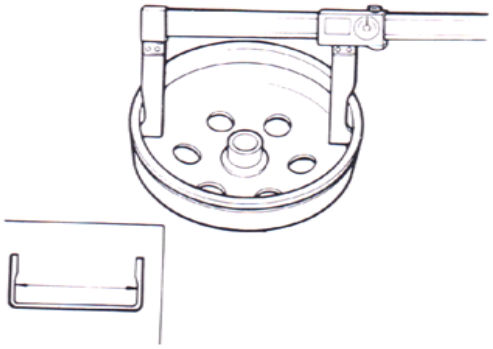


IX.DRIVE AND DRIVEN PULLEYS & KICK STARTER

Inspection clutch outer.

Service limit： 125.5mm

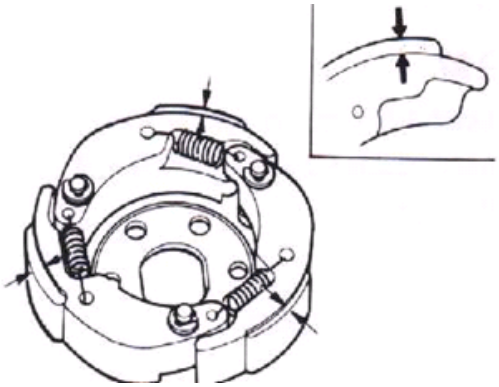
Measure the inner diameter of friction surface for clutch outer. If it is out of standard , please replace the new one.



Inspection clutch brake pad

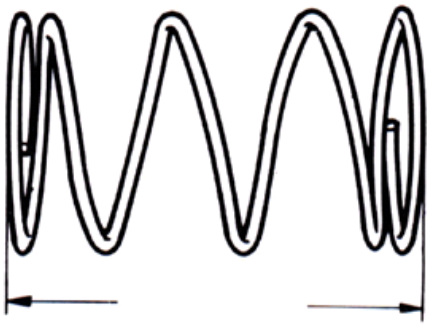
Service limit：2.0mm

Measure the width of each pad, if it is not as standard , replace the new parts.



Inspection clutch spring

Measure the clutch spring's free length, if it is out of standard, please replace for new part.



Inspection driven pulley assy.

Inspection driven pulley face.

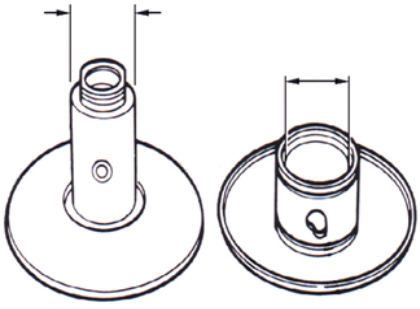
Measure the driven face O. D.

SERVICE LIMIT: 33.92 mm

Inspection movable driven face.

Measure the movable drive face I. D.

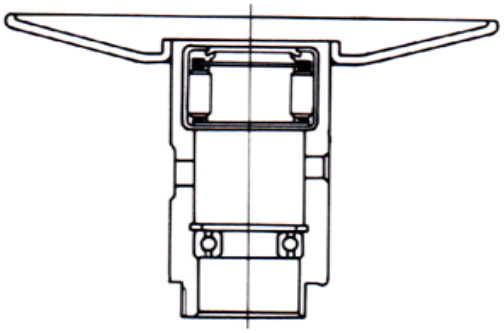
SERVICE LIMIT: 34.06 mm



IX.DRIVE AND DRIVEN PULLEYS & KICK STARTER

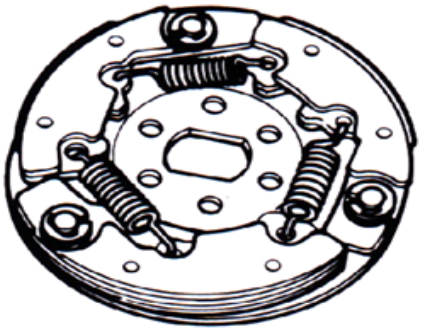
INSPECTION DRIVEN FACE BEARING.

Inspection inner bearing seal is damaged or not.
Inspection needle bearing is damaged or bigger clearance.

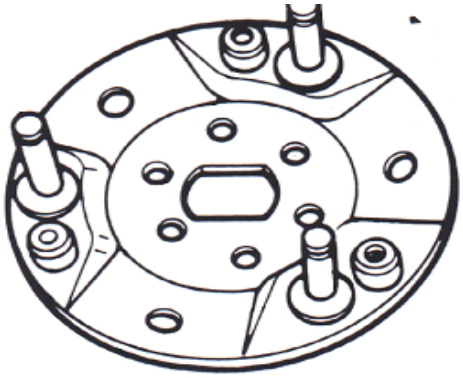


INSPECTION REPLACE THE CLUTCH PARTS.

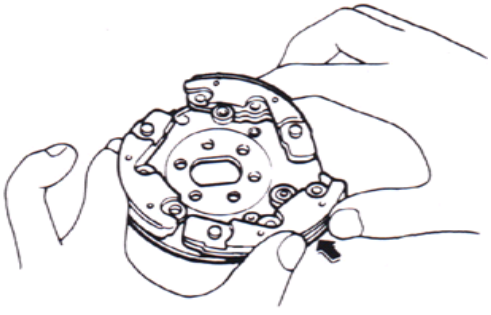
Dismantle the C-clip & washer, then disassemble the clutch part & spring from drive plate.
Inspect if the spring is damaged or with enough tension.



Inspection clutch damper rubber is damaged out of shape.
Apply some grease installing pin.

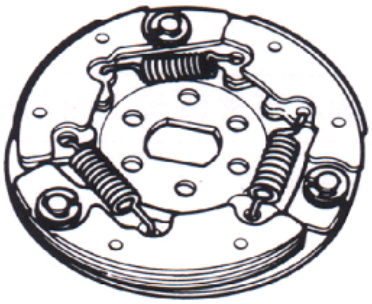


Apply some grease on installing pin but not on clutch parts.
If there is grease on clutch parts then replacement required.
Put new clutch parts on installing pin and make sure the position.
Use vise to install the spring into groove.



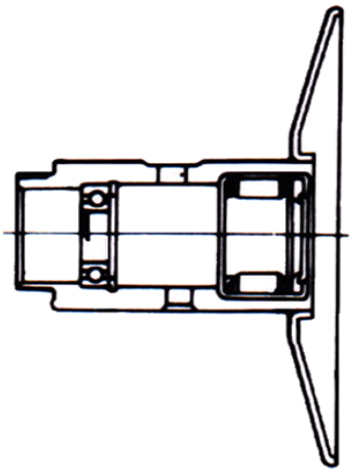
IX.DRIVE AND DRIVEN PULLEYS & KICK STARTER

Install the cir-clip to driven plate comp.
Installing pin.

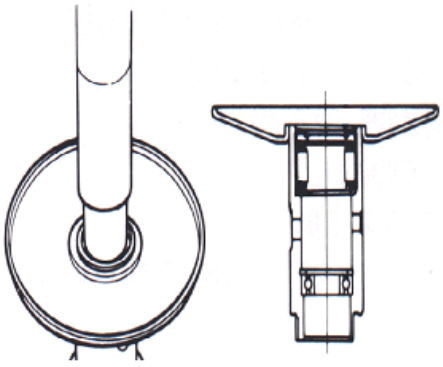


Change drive face bearing
Remove the inner bearing

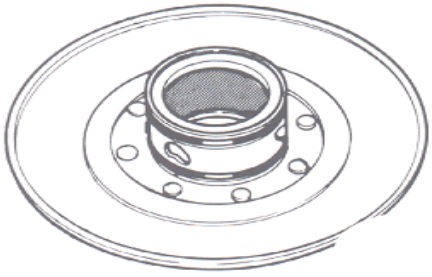
ATTENTION!!!
There is an oil seal at one side of inner bearing in drive face, dismantle the oil seal firstly. For needle bearing, disassemble the c-clip first then for bearing.



Install the new bearing, the seal side should towards to outside.
Apply the required grease.
Install the cir-clip to install the bearing.
Install the new inner bearing

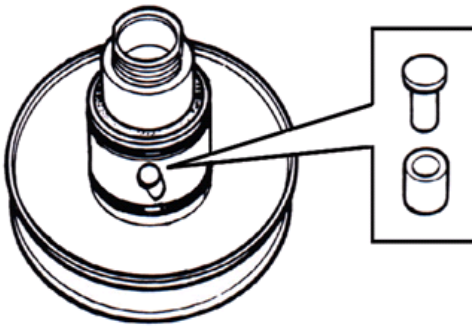


Assembly of clutch / drive face assy.
Install the new oil seal & o-ring on movable driven face assy.

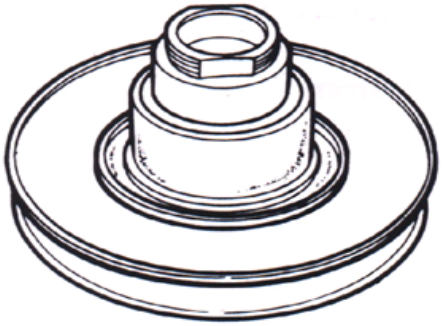


IX.DRIVE AND DRIVEN PULLEYS & KICK STARTER

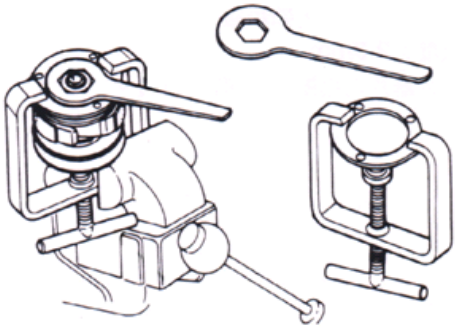
Install the movable driven face comp. to driven face.
Install guide roller & roller guide pin.
Install oil seal



Assemble the drive face driven face spring, and clutch into clutch spring condenser, turn the condenser shaft to press assy. part until the installing nut can be assembled on.
Put clutch spring condenser on vise, use special nut wrench to tighten the nut with required torque.
torque：5.0~6.0kgf-m



Install transmission shaft to clutch, drive face, and drive belt.

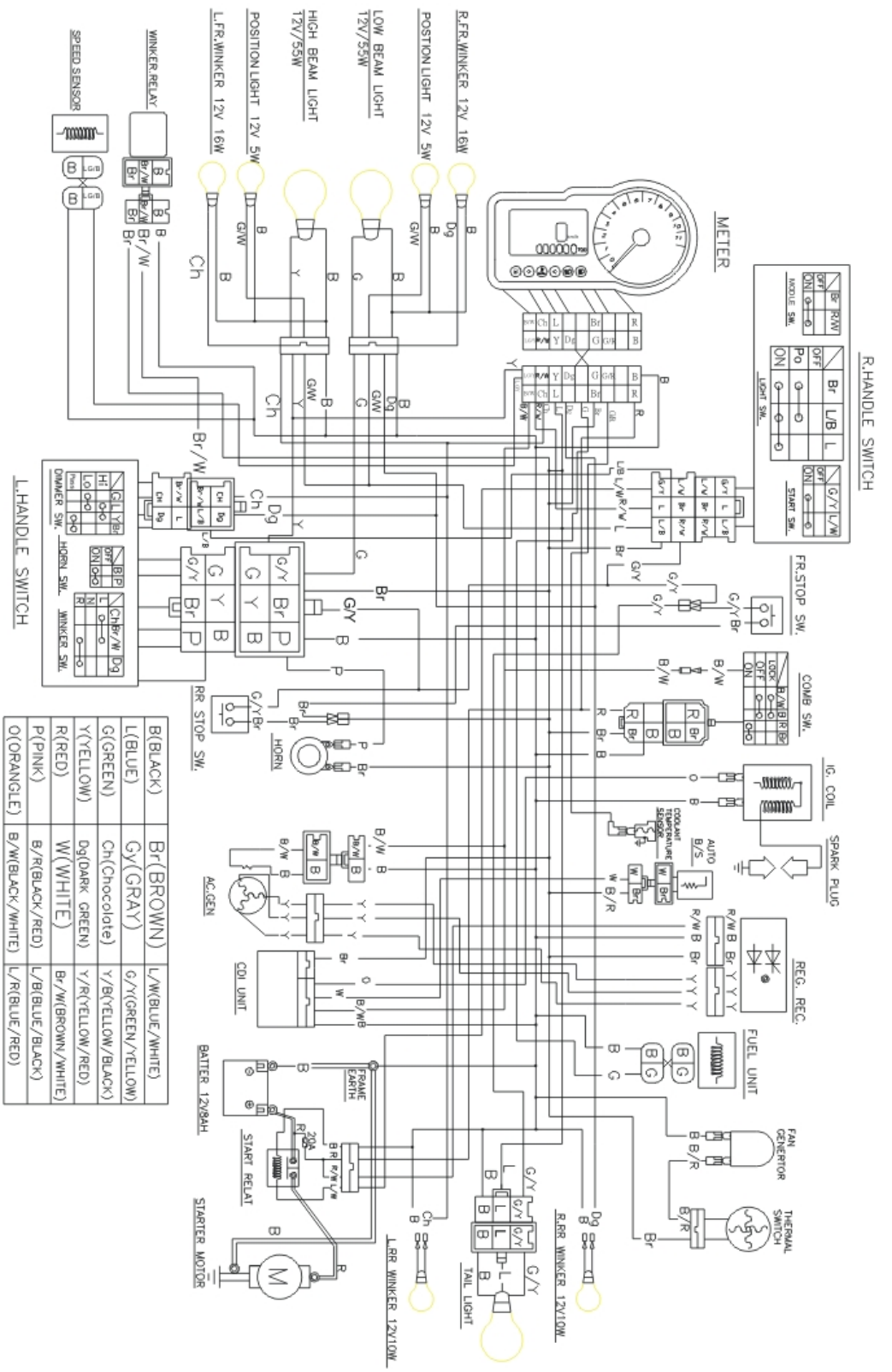


IX.DRIVE AND DRIVEN PULLEYS & KICK STARTER

MEMO….

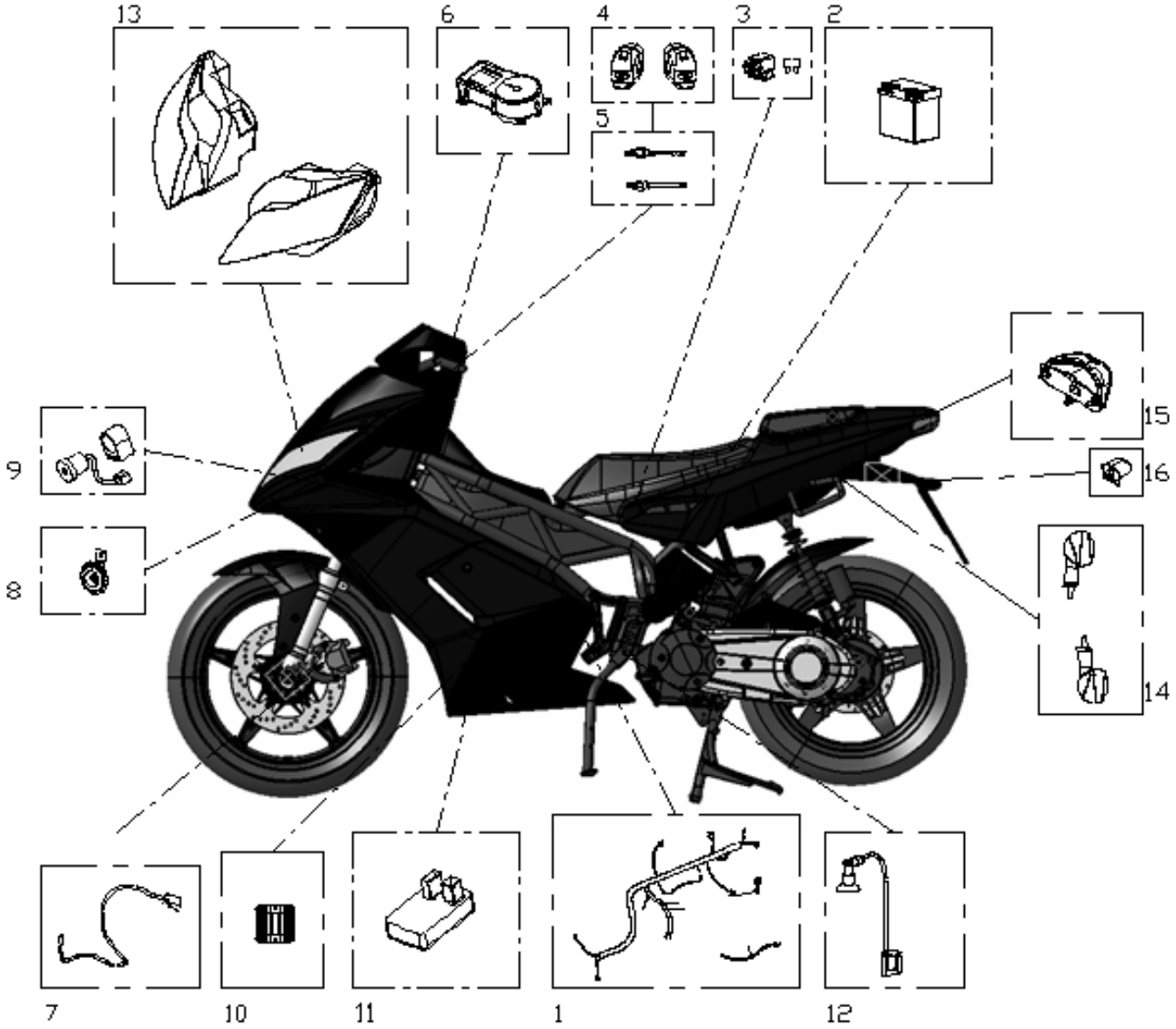
X.ELECTRIC SYSTEM

GTR 180 CIRCUIT DIAGRAM



X.ELECTRIC SYSTEM

ELECTRIC PARTS LOCATION



X.ELECTRIC SYSTEM

BATTERY

PRECAUTIONS

- ✧ There are a number of important precautions that must to service electrical systems.
- ✧ Learn and ob-serve all the rules below.
- ✧ Do not reverse the battery cable connections.
- ✧ This will burn out the diodes on the electrical parts.
- ✧ Always check battery condition before condemning other parts of an electrical system a fully charged battery is a must for conducting accurate electrical system tests.
- ✧ The electrical parts should never be struck sharply, as with a hammer, or allowed to fall on a hard surface. Such a shock to the parts can damage them.
- ✧ To prevent damage to electrical parts, do not disconnect the battery cables or any other electrical connections when the ignition switch is on, or while the engine is running.
- ✧ Because of the large amount of current, never keep the starter button pushed when the starter motor will not turn over, or the current may burn out the starter motor windings.
- ✧ Do not use a meter illumination bulb rated for other than voltage or wattage specified in the wiring diagram, as the meter or gauge panel could be warped by excessive heat radiated from the bulb.
- ✧ Take care not to short the leads that are directly connected to the battery positive (+) terminal to the chassis ground.
- ✧ Troubles may involve one or in some cases all items.
- ✧ Never replace a defective part without determining what CAUSED the failure. If the failure was caused by some other item or items, they must be repaired or replaced, or the new replacement will soon fail again.
- ✧ Make sure all connectors in the circuit are clean and tight, and examine wires for signs of burning, fraying, etc. Poor wires and bad connections will affect electrical system operation.
- ✧ ○Measure coil and winding resistance when the part is cold(at room temperature)

X.ELECTRIC SYSTEM

SPECIFICTION

CHARGEABLE SYSTEM

ITEM		SPECIFICATION	
ELECTRONIC VASE	CAPACITY	YTX9-BS 12 V8Ah	
	CHARGED RATE	0.7A / 5~10hr (STANDARD) 3A / 1hr (URGENT USE)	
ELECTRONIC LAEKAGE OF ELECT. CURRENT		1Ma UNDER	
CHARGEABLE OF ELECT. CURRENT		1.2A / 2000 rpm	1.2A / 1600 rpm
CONTROL CHARGED CURRENT		14.5+0.5 V / 2000 rpm	

IGNITION SYSTEM

ITEM		SPECITICATION
SPARK PLUG	TYPE	NGK DPR7EA-9
	SPACE	0.7~0.8mm
COIL RESISTANCE VALVE	ONCE COIL	0.4Ω±10%(20ºC)
	TWICE COIL	3.6KΩ±10%
PULSE WAVE COIL-RESISTANCE VALVE		110Ω±15%
IGNITION STARTING	STARTING BTDC	13±1°/1700rpm
	MOVING ANGLE FEATURE BTDC	15°/2500±200rpm
		38°/6200±200rpm
		40±1.5°/7000rpm

STARTING SYSTEM

ITEM		SPECIFITION
STARTING MOTOR	SHAPE	TURBO-DYNAMO TYPE
	CONTRIBUTED POWER FEATURE	0.5 KWψ60

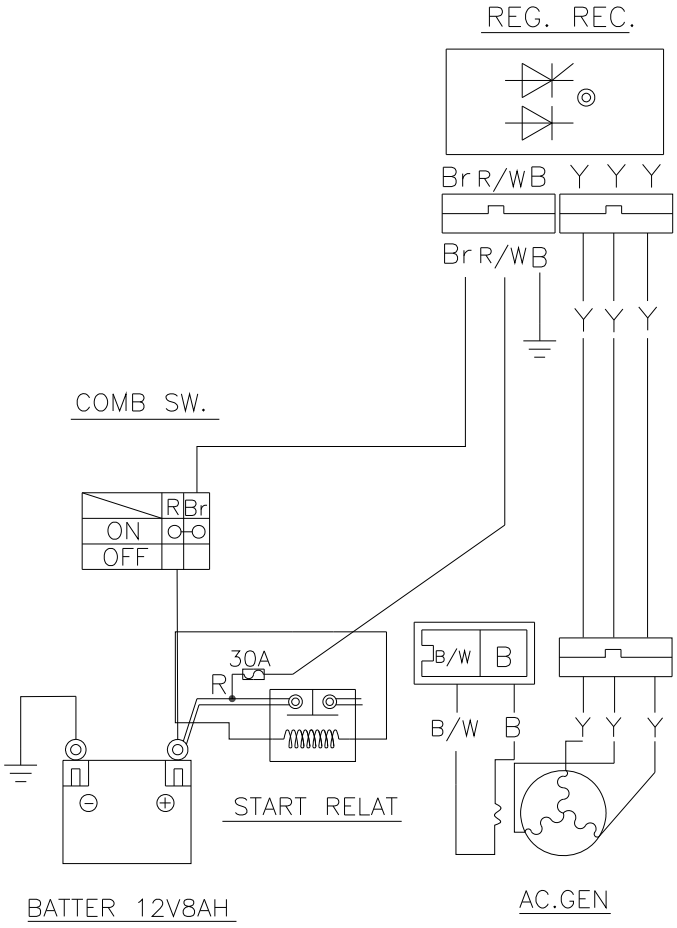
FUSE

ITEM	SPECIFICATION
VEHICLE LOADING	30A

X.ELECTRIC SYSTEM

CHARGEABLE SYSTEM

CHARGEABLE CIRCUIT DIAGRAMR



REGULATOR/RECTIFIER CHECKING

(KΩ)

+ / -	YELLOW1	YELLOW2	YELLOW3	WHITE/RED	BROWN	BLACK
YELLOW1		∞	——	2~20	——	——
YELLOW2	∞		——	2~20	——	——
YELLOW3	∞	∞		2~20	——	——
WHITE/RED	∞	∞	——		——	——
BROWN	10~100	10~100	10～100	50~150		10~100
BLACK	2~20	2~20	2~20	5~50	5~50	

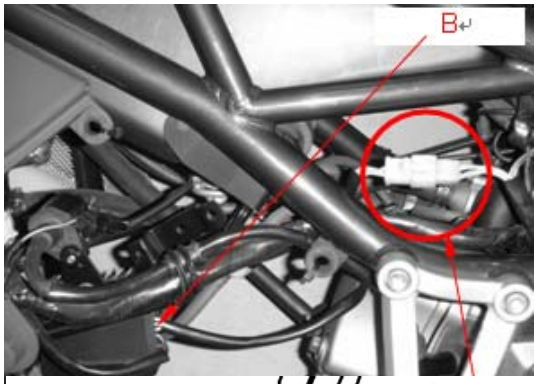
X.ELECTRIC SYSTEM

CHARGEABLE DIAGRAM CHECKING

REMOVE PROTECTED NET1，2& BELOW COVER。

A:RECTIFIER CONNECTOR

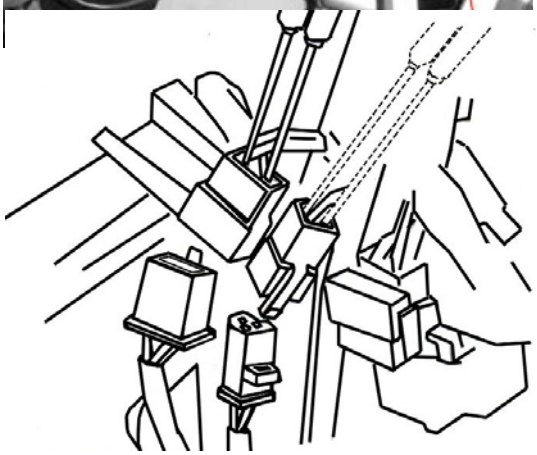
B:ADJUST REGULATOR



OPEN REGULAOR DIAGRAME CONNECTOR,

CHECK EVERY DIAGRAM SITUATION.

ITEM	MEASURE	STANDARD VALUE
MAIN SW CABLE	RED—BROWN	ELECT. VASE PRESSURE
BATTERY CONNECTOR	RED—BLACK	ELECT. VASE PRESSURE
CHARGEABLE COIL	YELLOW—YELLOW	0.4~1.2



IF CHECK WITH UNREGUAR VALUE, PLEASE CHECK UNREGULAR DIAGRAM。

IF PART IS WITH NORMAL,THEN HAVE THE DEFECTIVE PAIR WIRES。

IF ABOVE IS OK AFTER CHECKING, CHANGE RECTIFIER。

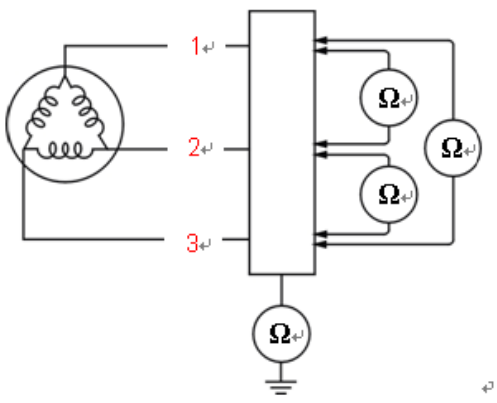
CHECK ACG COIL

OPEN ACG PLUGS, USE METER TO CHECK THERESISTANCE BETWEEN EACH OIL., AND DIRGRAM BETWEEN THE FRME

RESISTENACE VALUE；CHECK IF THERE IS ANYSHORTAGE?

IF THERE IS ANY UNNORMAL, PLEASE CHANGE NEW COIL SET。

	Ω
1(YELLOW)	0.4~1.2
2(YELLOW)	0.4~1.2
3(YELLOW)	0.4~1.2



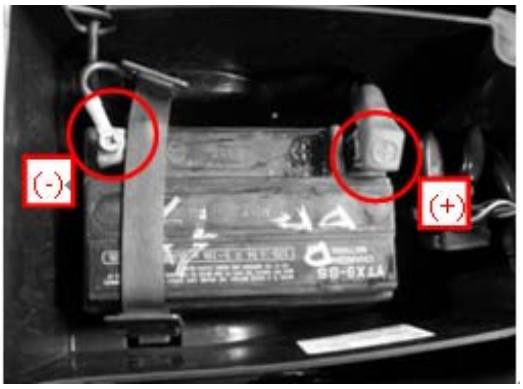
X.ELECTRIC SYSTEM

BATTERY REMOVAL

Remove:

Disconnect the negative (–) cable.

Slide out the positive (+) terminal cap and then disconnect the positive (+) cable.



NOTE
Be sure to disconnect the negative (–) cable first. Remove the battery.

BATTERY INSTALLION

Put the battery into the battery case.

Apply a light coat of grease on the terminals to prevent corrosion.

Install the positive (+) cable first.

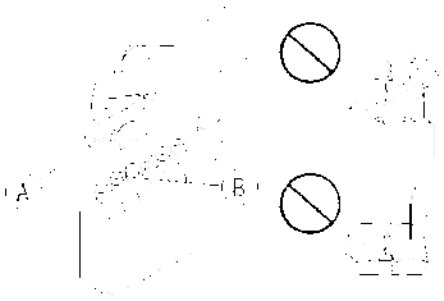
Cover the positive (+) terminal with the cap.

Install the negative (–) cable.

BATTERY ACTIVATION

ELECTROLYTE FILLING

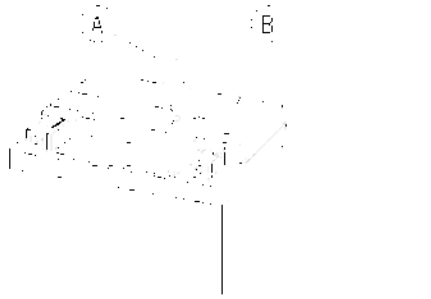
Make sure that the model name “A” of the electrolyte container matches the model name “B” of the battery. These



ATTENTION!!!
Names must be the same.

X.ELECTRIC SYSTEM

Do not remove the aluminum sealing sheet “A” from the filler ports “B” until just prior to use.
Be sure to use the dedicated electrolyte container for correct electrolyte volume.

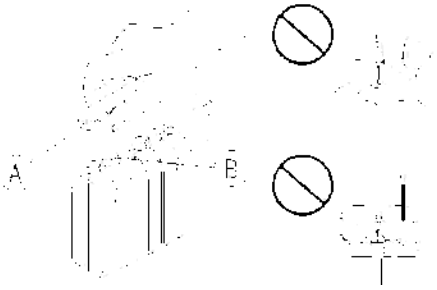


Place the battery on a level surface.
Check to see that the sealing sheet has no peeling, tears, or holes in it.

REMOVE THE SEALING SHEET.

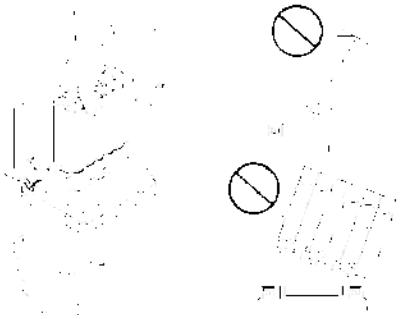
NOTE
The battery is vacuum sealed. If the sealing sheet has leaked air into the battery, it may require a longer initial charge.

Remove the electrolyte container from the vinyl bag.
Detach the strip of caps “A” from the container and set aside, these will be used later to seal the battery.



NOTE
Do not pierce or otherwise open the sealed cells “B” of the electrolyte container. Do not attempt to separate individual cells.

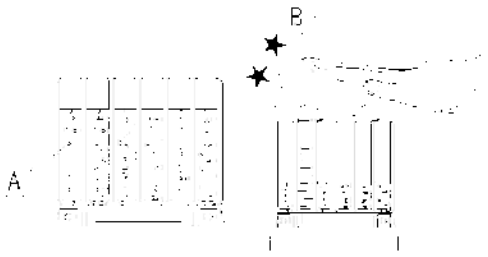
Place the electrolyte container upside down with the six sealed cells into the filler ports of the battery.
Hold the container level, push down to break the seals of all six cells.
You will see air bubbles rising into each cell as the ports fill.



NOTE
Do not tilt the electrolyte container.

X.ELECTRIC SYSTEM

Check the electrolyte flow.
If no air bubbles “A” are coming up from the filler ports, or if the container cells have not emptied completely, tap the container “B” a few times.
Keep the container in place for 20 minutes or more.
Don’t remove the container from the battery until its empty; the battery requires all entire electrolytes from the container for proper operation.

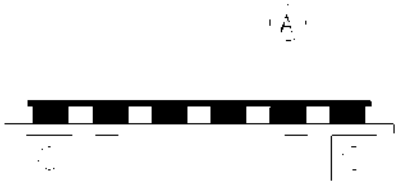


Removal of the container before it is completely empty can shorten the service life of the battery.
Do not remove the electrolyte container until it is completely empty and 20 minutes have elapsed.
Gently remove the container from the battery.
Let the battery sit for 30 minutes prior to charging to allow the electrolyte to permeate into the plates for optimum performance.

NOTE
Charging the battery immediately after filling can shorten service life. Let the battery sit for at least 30 minutes after filling.

Initial Charge

Place the strip “A” of caps loosely over the filler ports.
Newly activated sealed batteries require an initial charge.
Standard Charge: 1.2 A × 5 10 hours
If using a recommended battery charger, follow the charger’s instructions for newly activated sealed battery.
Yuasa 1.5 Amp Automatic Charger Battery Mate

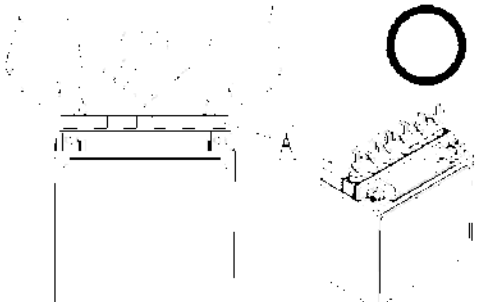


If the above chargers are not available, use equivalent one.

X.ELECTRIC SYSTEM

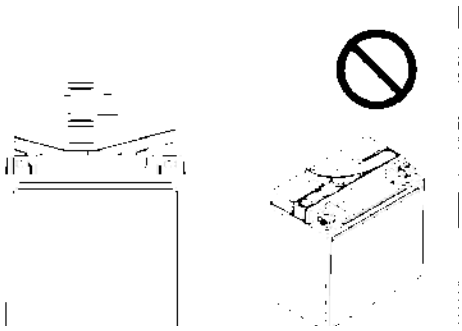
NOTE
Charging rates will vary depending on how long the battery has been stored, temperature, and the type of charger used. Let battery sit 30 minutes after initial charge, then check voltage using a voltmeter. If it is not at least 12.8 V, repeat charging cycle.

After charging is completed, press down firmly with both hands to seat the strip of caps “A” into the battery (don’t pound or hammer.). When properly installed, the strip of the caps will be level with the top of the battery.



Once the strip of the caps “A” is installed onto the battery, never remove the caps, nor add water or electrolyte to the battery.

NOTE
To ensure maximum battery life and customer satisfaction, it is recommended the battery be load tested at three times its amp-hour rating for 15 seconds. Re-check voltage and if less than 12.8 V repeat the charging cycle and load test. If still below 12.8 V the battery is defective.



X.ELECTRIC SYSTEM

PRECAUTIONS

(1) NO NEED OF TOPPING-UP

No topping-up is necessary in this battery until it ends its life under normal use. Forcibly prying off the seal cap to add water is very dangerous.
Never do that.

(2) REFRESHING CHARGE.

If an engine will not start, a horn sounds weak, or lamps are dim, it indicates the battery has been discharged. Give refresh charge for 5 to 10 hours with charge current shown in the specification (see Specifications section).
When a fast charge is inevitably required, do it following precisely the maximum charge current and time conditions indicated on the battery.

This battery is designed to sustain no unusual deterioration if refresh-charged according to the method specified above. However, the battery's performance may be reduced noticeably if charged under conditions other than given above.
Never remove the seal cap during refresh charge.
If by chance an excessive amount of gas is generated due to overcharging, the relief valve releases the gas to keep the battery normal.

(3) WHEN YOU DO NOT USE THE MOTORCYCLE FOR MONTHS.

Give a refresh charge before you store the motorcycle and store it with the negative cable removed.
Give a refresh charge once a month during storage.

(4) BATTERY LIFE

If the battery will not start the engine even after several refresh charges, the battery has exceeded its useful life.

Replace it (Provided, however, the vehicle's starting system has no problem).

X.ELECTRIC SYSTEM

WARNING!!!
Keep the battery away from sparks and open flames during charging, since the battery gives off an explosive gas mixture of hydrogen and oxygen. When using a battery charger, connect the battery to the charger before turning on the charger. This procedure prevents sparks at the battery terminals which could ignite any battery gases. No fire should be drawn near the battery, or no terminals should have the tightening loosened. The electrolyte contains sulfuric acid. Be careful not to have it touch your skin or eyes. If touched, wash it off with liberal amount of water. Get medial attention if severe.

INTERCHANGE

A sealed battery can fully display its performance only when combined with a proper vehicle electric system. Therefore, replace a sealed battery only on a motorcycle which was originally equipped with a sealed battery.

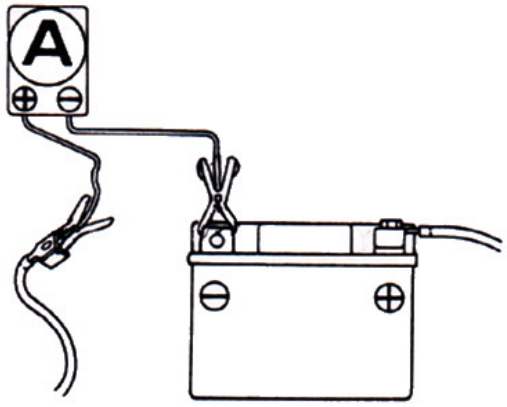
Be careful, if a sealed battery is installed on a motorcycle which had an ordinary battery as original equipment, the sealed battery's life will be shortened.

X.ELECTRIC SYSTEM

OIL LEAKAGE TESTNG

Turn main swich at off position and remove canvas wire from the battery.

Connect ampere meter (as right drawing shown) between negative pole (-) and canvas wire. ◦

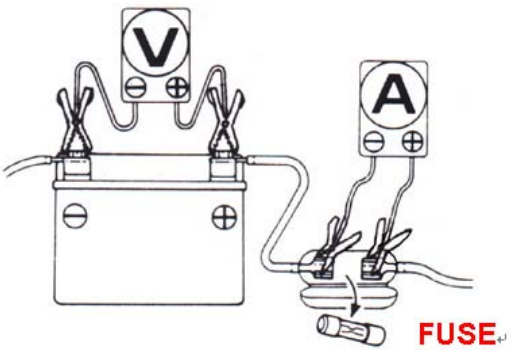


ATTENTION!!!
Adjust electric current of meter to larger scale when test current, then adjust smaller scale gradually to avoid meter and fuse burn out if current is over the max. Of meter. Main switch can't be at on position when test electric current leakage. If electric current leakage is over standard value, it has short circuit status. Electric current leakage: 1 ma under. Open each connector to find out short ciucuit under situation of current leakage.

Chargeable electric voltage/current inspection

ATTENTION!!!
Make sure the battery have been charged completely before checking. The battery voltage shall be over 13.0V when complete the charge, if it's with insufficiency power, the electric current volume maybe change suddenly. Don't use the starter motor for engine starting or large electric current will be flowed out and lose much electric power.

Remove the original battery and install battery of full power after engine starting for a while. Use the digital voltmeter to test the voltage of battery connector. Use Ampere meter to test electric current between the two connectors of main fuse.



ATTENTION!!!
Please use the Ampere meter to have the signal of positive/negative pole, if use the Ampere meter to have one direction to test, the discharge electricity shall be 0 ampere.

X.ELECTRIC SYSTEM

ATTENTION!!!
Please do not use any wire of short circuit。 By using the Ampere meter to connect between the battery positive connector and ⊕ cable, even it can test the electric current and will damage the electric meter when start the motor suddenly; suggest using the foot shaft to start the engine. Please put main switch to 'OFF' position when connect the Ampere meter. If open the Ampere meter or cable, it will be damaged when electric current is running.

Connect one engine rotation meter, start the engine and turn on the head lamp on the far-reaching position. Add the engine rotational speed gradually and test the chargeable voltage/current for rotational speed of per minute.

Rechargeable electric current：0.6A up/2500rpm & 1.2A up/6000rpm

Rechargeable controlled electric current：14.5 V/2000rpm

ATTENTION!!!
Make sure the rechargeable current and voltage to be normal when change a new battery.

Most of question is relative with rechargeable system for the following various condition, please follow the failure checking step to check one by one:

①. Rechargeable electric voltage can not be increased and surpass the voltage of battery connector, the rechargeable electric current is on the direction of discharge electricity.

②. Rechargeable electric voltage and current is larger than the standard.

If the condition is no relationship with the above, the most condition has nothing to do with the rechargeable system. Please execute the following checking and follow the failure sheet to check one by one.

①. It can be reached the standard rechargeable electric voltage/current when engine rotational speed surpasses the regulated rotational speed per minute.

The surpassed electronic power is cause by using the bulb over the regulated power.

Change the battery of old or no enough capacity.

②. Normal rechargeable electric voltage but un-normal rechargeable electric current

Change the battery of old or no enough capacity

Use the battery with insufficient power or surpassed battery of recharging

The fuse of Ampere meter is burnt

Un-proper connection of Ampere meter

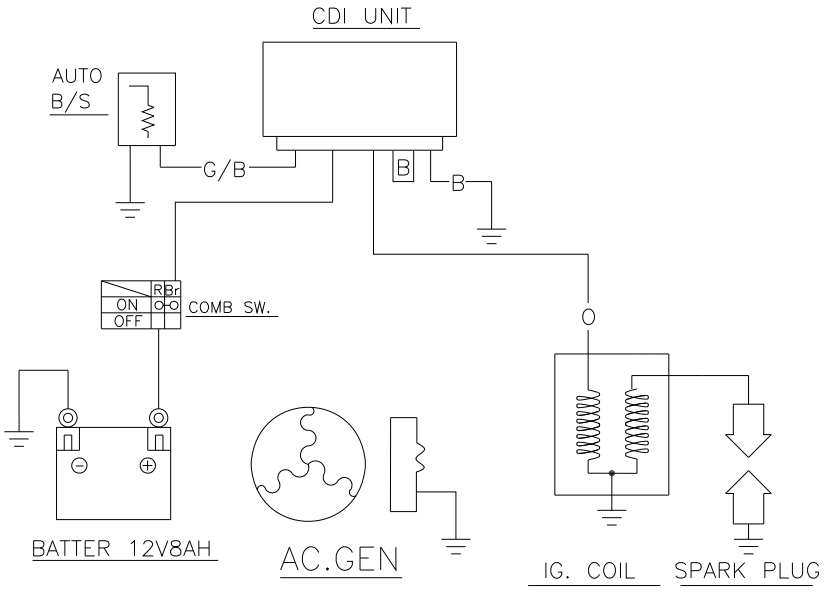
③. With normal rechargeable current but with un-normal rechargeable voltage

The fuse of voltmeter is burnt

X.ELECTRIC SYSTEM

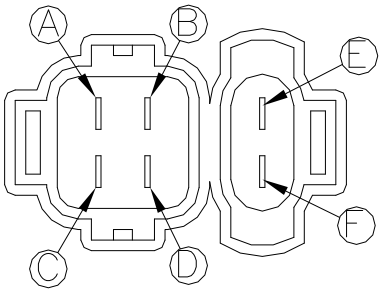
The Ignition System

Turbo CDI Ignition System circuit diagram



Turbo CDI Checking (MIS Ignition System)

CDI connection



Meter(+) / Meter(-)	A	B	C	D	E	F
A		—	50~250	50`250	100~500	500~∞
B	100~500		2~20	2~20	5~50	10~100
C	50~250	—		0	2~20	5~50
D	50~250	—	0		2~20	5~50
E	—	—	—	—		—
F	100~500	—	10~100	—	50~250	

X.ELECTRIC SYSTEM

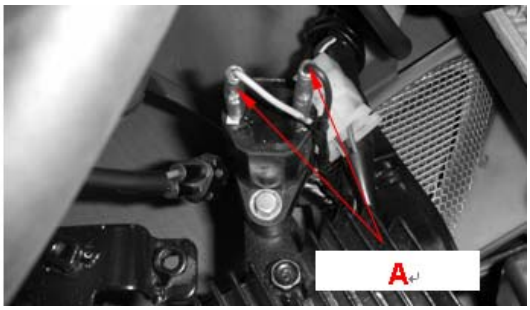
Ignition Coil

Dismantle

Remove protected net 1.2、under cover

Remove spark cover

Remove ignition coil – Leading wire ”A”。



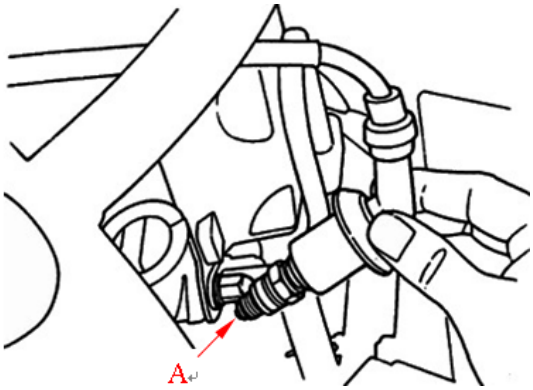
Remove the bolt of ignition coil, take out the coil.

Installation will be used opposite procedure of dismantling.

ATTENTION!!!
Once coil is black wire to connect the black connector, pink wire connect the green connector.

Spark Plug confirmation

Remove spark plug as the right drawing, install good spark on the spark cap and match the engine starting situation to make sure if the spark plug to have normal function. If the ignition situation is no good or the spark plus have been burned, please change a new spark plug.

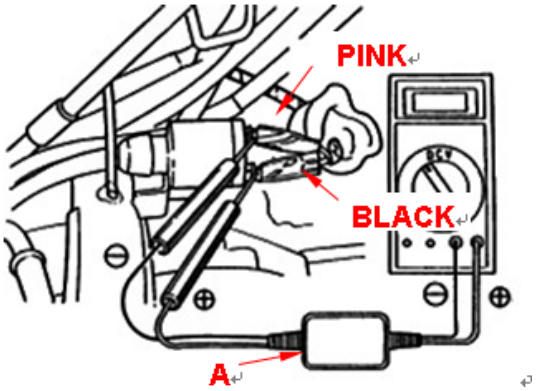


ATTNENTION!!!
Each electric circuit need to match the proper connection and test. It’ll have no good testing sometime even have the proper connection.

Connect the high pressure Shunt (“A”) on the electric meter or use the meter with input impedance of Ω 100V up. Remove the middle cover.

Connect the meter cable with once coil terminal (black wire and pink wire). Push the starter button or step on the starter lever, test the maximum electric voltage of ignition coil.

Connection：(+) terminal connect green (–) terminal connect black/yellow.



X.ELECTRIC SYSTEM

Min. electric voltage：95 V up

ATTENTION!!!
The finger shall not touch the metal portion when survey the electric voltage or get an electric shock. Please pay attention to this point specially.

INSPECTION

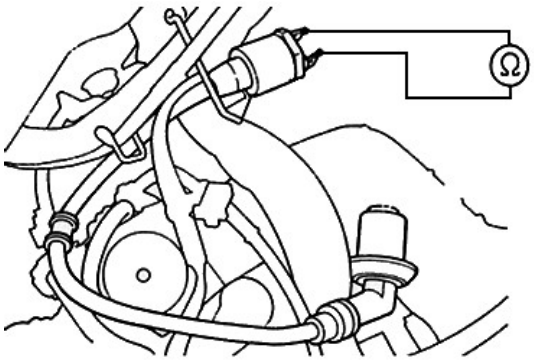
Once Coil

Open the terminal connecting of 'once coil' and test the impedance value of 'once coil'.

Standard：0.4Ω± 10%(20°)

Impedance value is within standard to be good.

Impedance value〝∞〞express the coil to be broken, it's need to change a new one.



Twice Coil

Enclosed the spark plug cover, test impedance value of the high-pressured guide wire of spark plug and the green terminal.

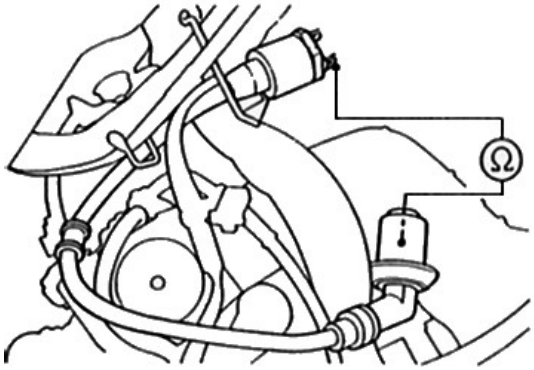
Standard Value：13.6 KΩ± 10% (20°C)

Open the cover of spark plug, test impedance value of the high-pressured guide wire of spark plug and the green terminal.

Standard Value：3.6KΩ± 10 % (20°C)

The impedance value is within the standard to be good.

The impedance value "∞" express the coil to be broken and have to change a new one. If it enclose spark plug cover, survey value is no met the standard, it's expressed the defection of spark plug.



X.ELECTRIC SYSTEM

Replacement

Replace the ignition coil if it's necessary to remove the bolt (bolt x 1) of ignition coil.

SPHYGMOGRAM Coil

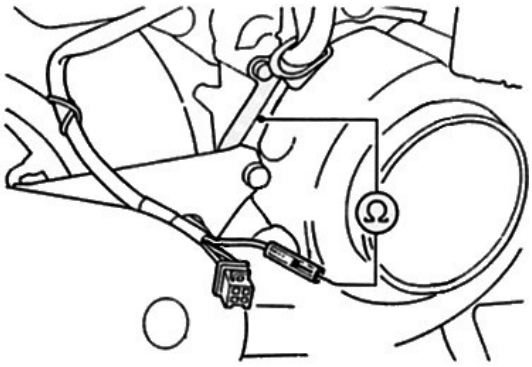
Inspection

Remove the under cover

Remove the wire connector of Sphygmogram equipment.

Test the impedance value of blue wire beside engine/yellow

Terminal and body iron parts.



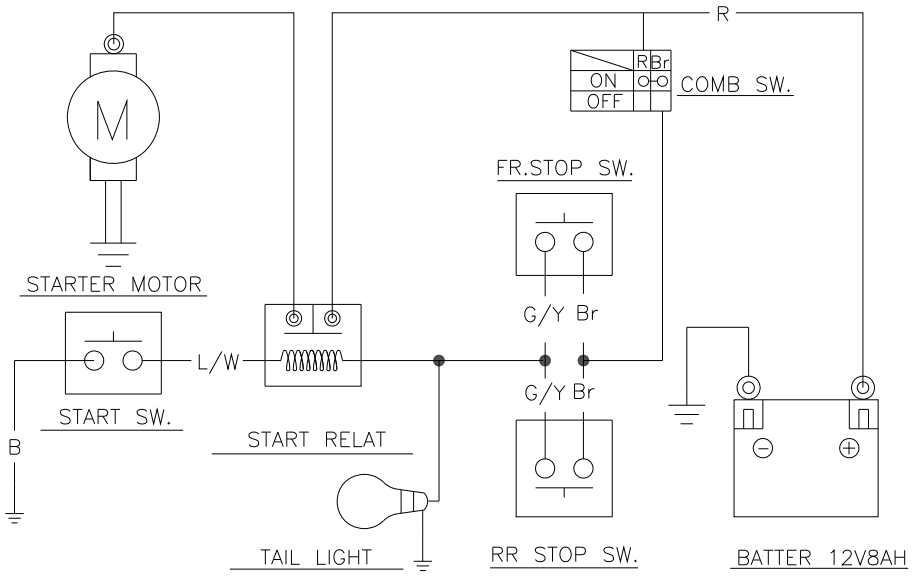
Standard：110Ω± 15 % (20°C)

Change Generator if test the value over the standard

ATTENTION
When check the sphygmogram coil, please make sure this testing is under the normal compress pressure condition of the cylinder and the spark plug is installed on the cylinder head.

X.ELECTRIC SYSTEM

Circuit of Starting System



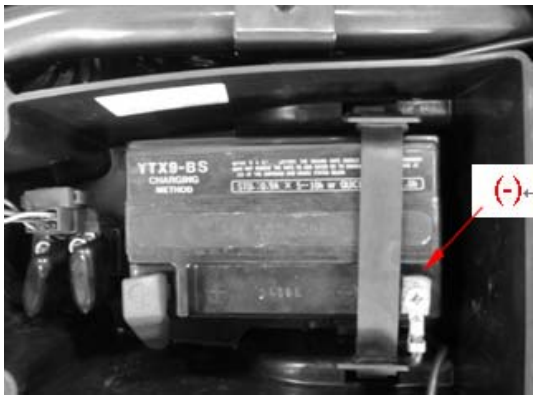
Inspection of Starting Relay

Open main switch

Pull the brake lever

Push the starting button

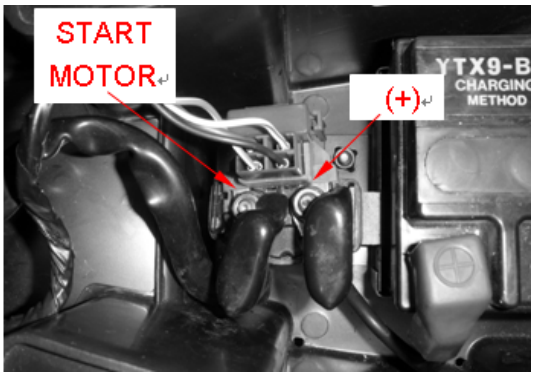
The relay is on normal function if hear the ”Ka Ka” sound.



Remove the luggage

Open the wire of negative pole (-) of battery

Open the wire of positive pole (+) of battery and the starting motor wire from the big terminal of starting relay.



Open the power connector of starting relay

Connect an Ohmmeter between the big terminal of relay

Also connect white/red wire to positive pole (+) of battery, blue/white wire to the negative pole (-) of battery.

Inspect if it is with passageway between the big terminal of relay.

Change the starting relay if no good circuit.

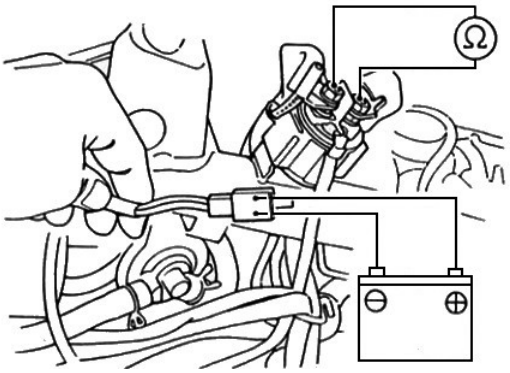
X.ELECTRIC SYSTEM

Dismantle the starting motor

Close the power of main switch

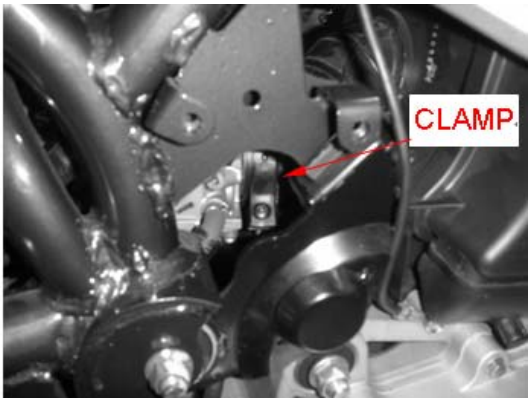
Remove the luggage

Open the wire of negative pole (–) of battery



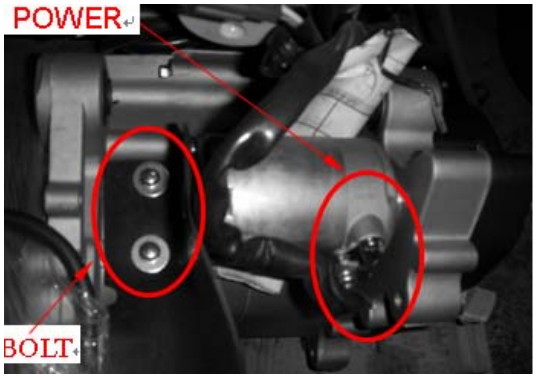
Remove the tube clamp on the air cleaner and bolt.

Please refer 4-1 ~ 4-2



Remove the wire of starting motor

Remove starting motor (bolt × 2)

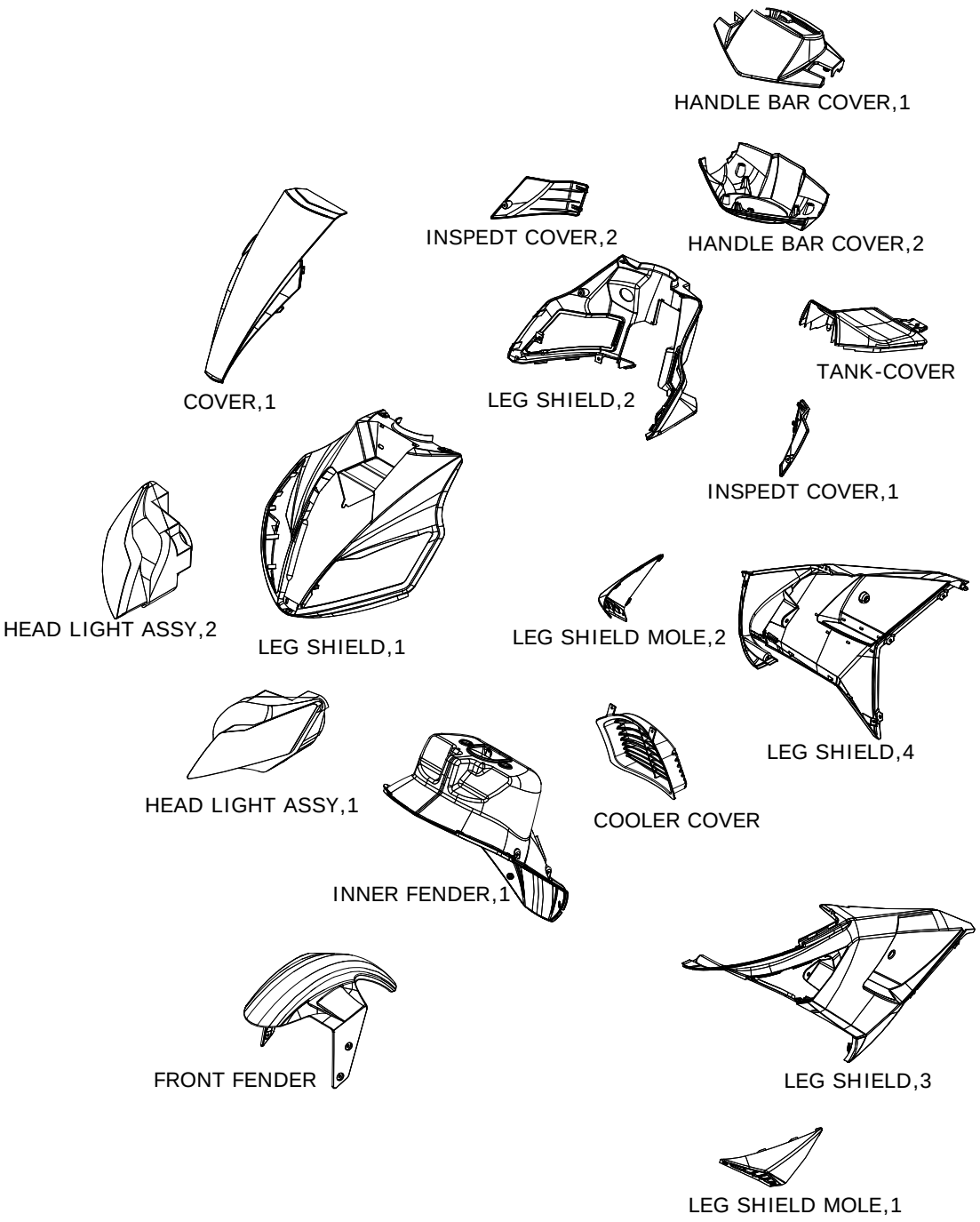


Install the starting motor

Install the motor as opposite procedure of dismantling

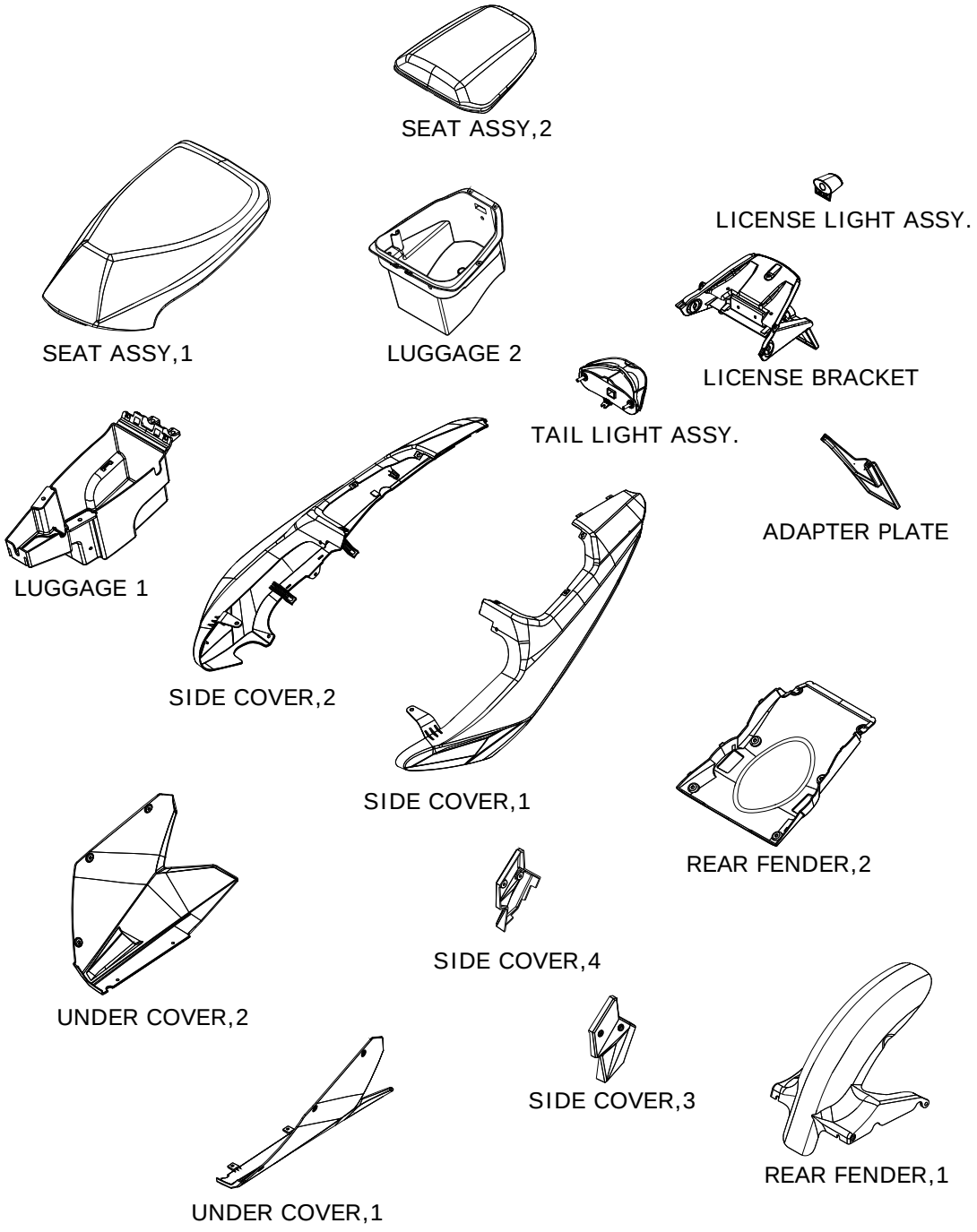
XI.FRAME

FRAME EXPOLODED VIEW

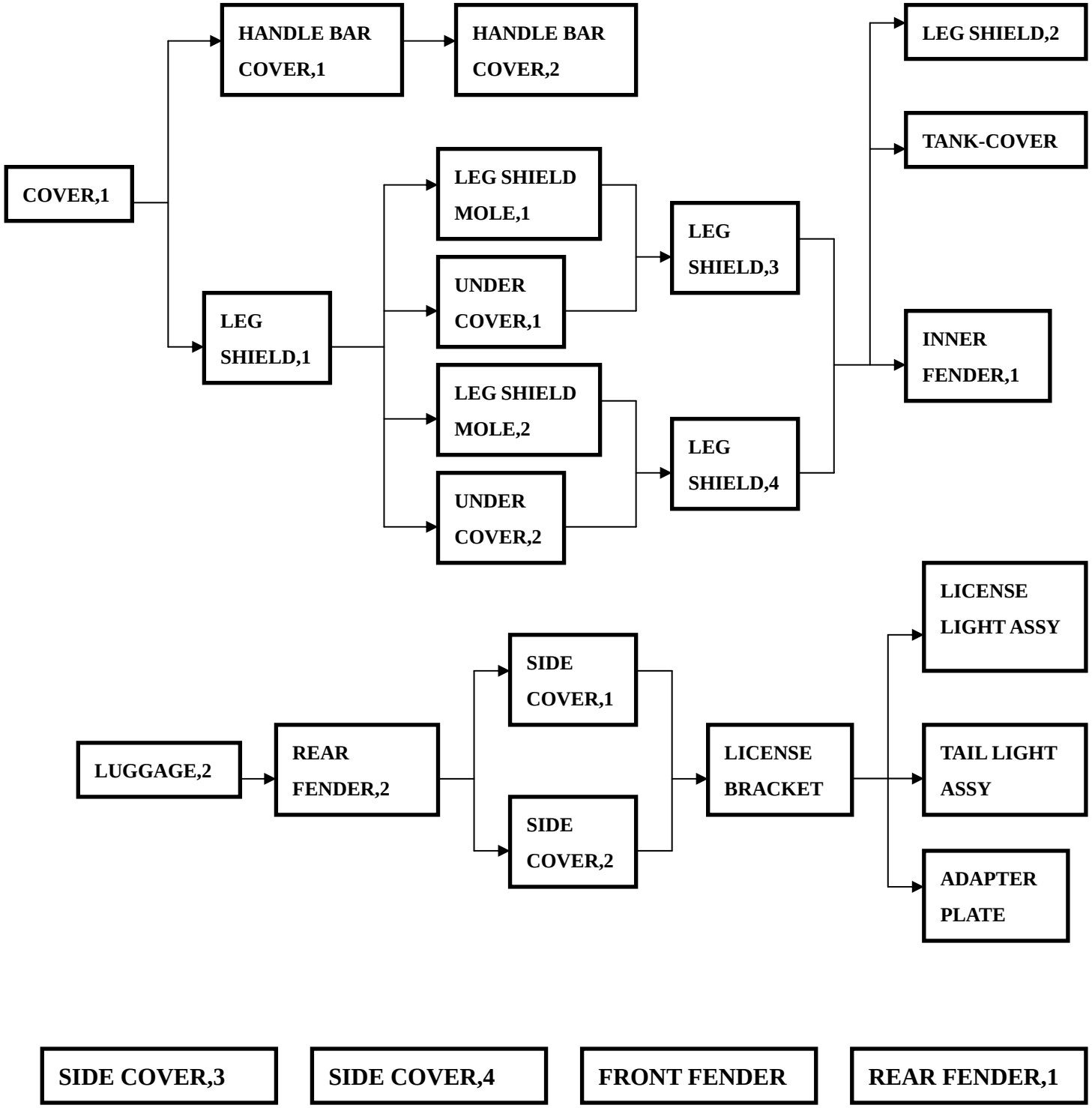


XI.FRAME

FRAME EXPOLODED VIEW



XI.FRAME

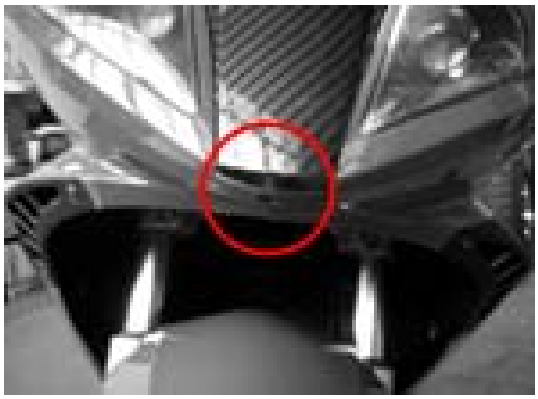

COVER,1
HANDLE BAR COVER,1
HANDLE BAR COVER,2
LEG SHIELD,1
LEG SHIELD MOLE,1
UNDER COVER,1
LEG SHIELD MOLE,2
UNDER COVER,2
LEG SHIELD,3
LEG SHIELD,4
LEG SHIELD,2
TANK-COVER
INNER FENDER,1
LUGGAGE,2
REAR FENDER,2
SIDE COVER,1
SIDE COVER,2
LICENSE BRACKET
LICENSE LIGHT ASSY
TAIL LIGHT ASSY
ADAPTER PLATE
SIDE COVER,3
SIDE COVER,4
FRONT FENDER
REAR FENDER,1

XI.FRAME

FRAME REMOVAL/INSTALLATION

COVER,1 REMOVAL

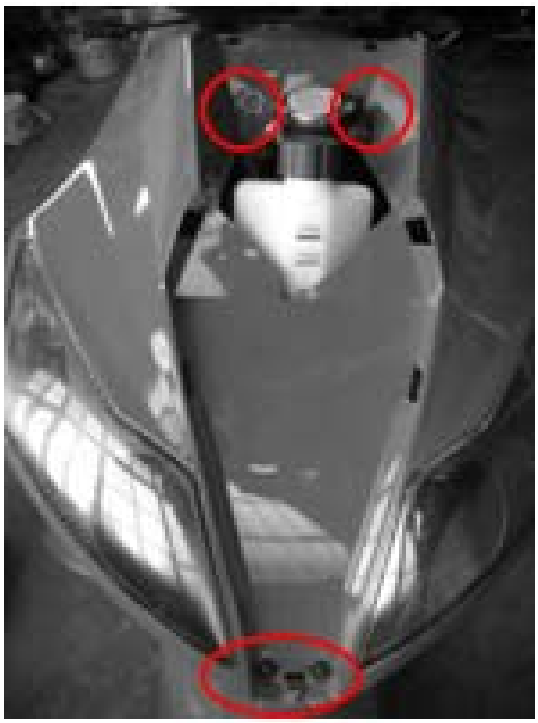
Removal the socket bolt



LEG SHIELD,1 REMOVAL

Removal 2 bolt

Removal 2 bolt w/washer

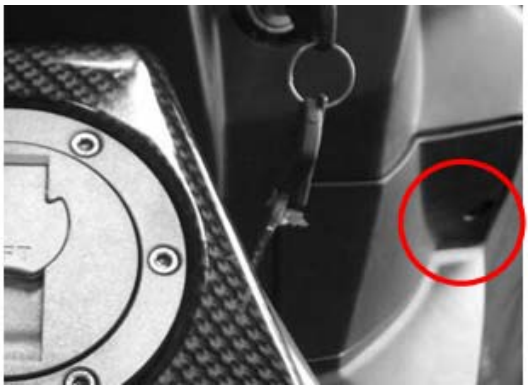


Removal 4 tapping screw

XI.FRAME

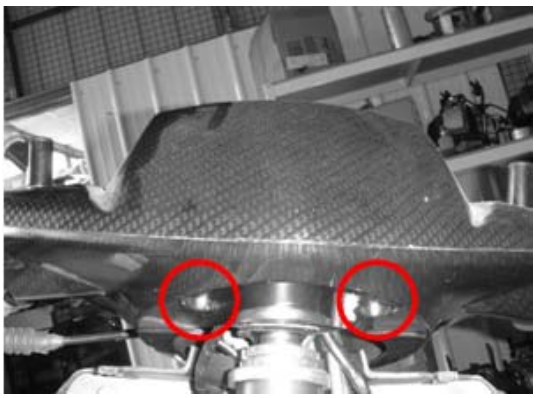
Removal “HEAD LIGHT” connect

Inspet cove,1&2 removal
Removal 2 tapping screw



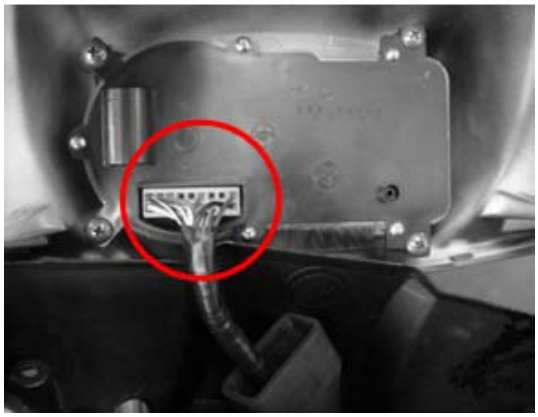
Handle bar cover,1 removal
Removal 2 tapping screw

Removal 2 tapping screw

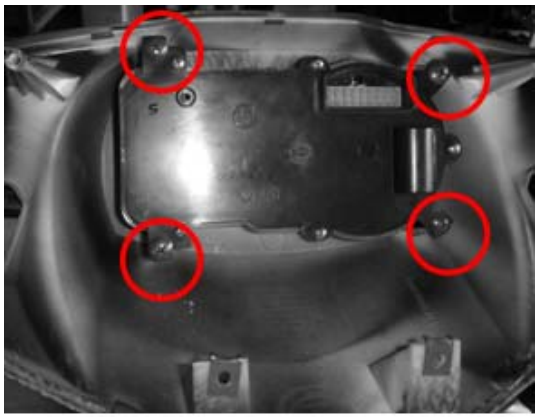


XI.FRAME

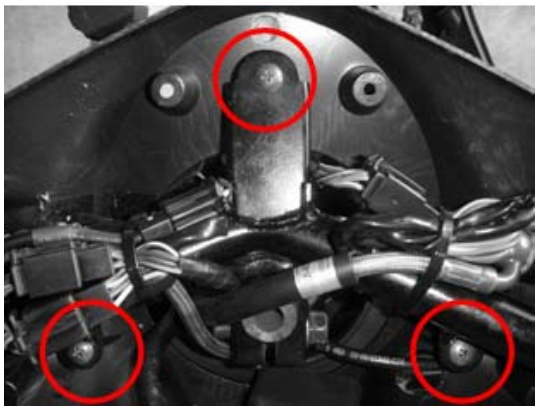
Removal “SPEEDMETER” connect



Removal 4 tapping screw

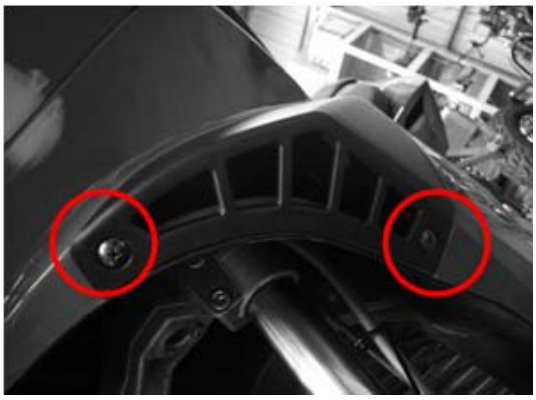


Removal 3 tapping screw



LEG SHIELD MOLE,1&2 REMOVAL

Removal 4 tapping screw



XI.FRAME

UNDER COVER,1&2 REMOVAL

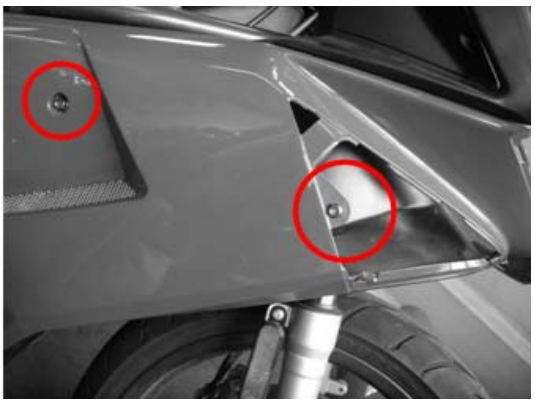
Removal 6 tapping screw

LEG SHILED,3&4 REMOVAL

Removal 2 tapping screw

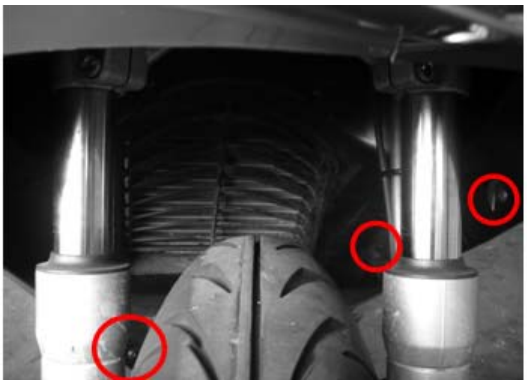
LEG SHIELD MOLE,1&2 REMOVAL

Removal 4 bolt



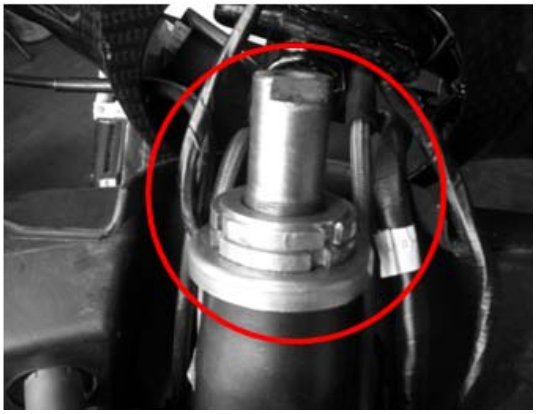
INNER FENDER,1 REMOVAL

Removal 6 tapping screw

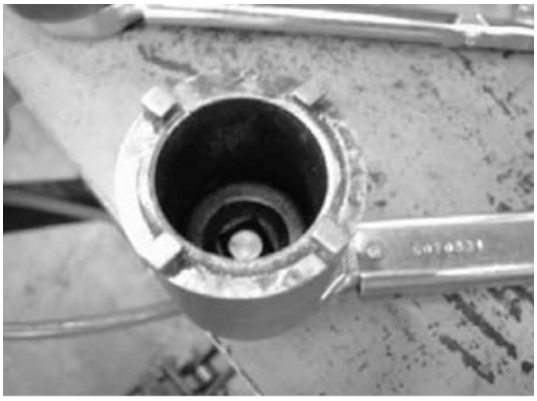


XI.FRAME

Removal “FRONT FORK” nut



NOTE
You can use special tool

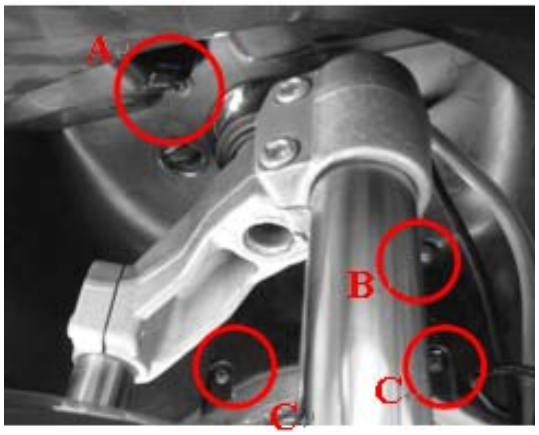


INNER FENDER,1 REMOVAL

Removal 2 bolt w/washer (A)

Removal 2 bolt (B)

Removal 2 bolt (C)



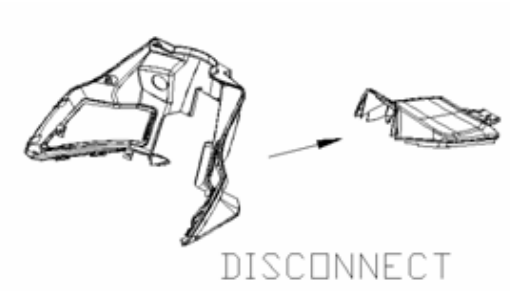
TANK-COVER REMOVAL

Removal bolt

XI.FRAME

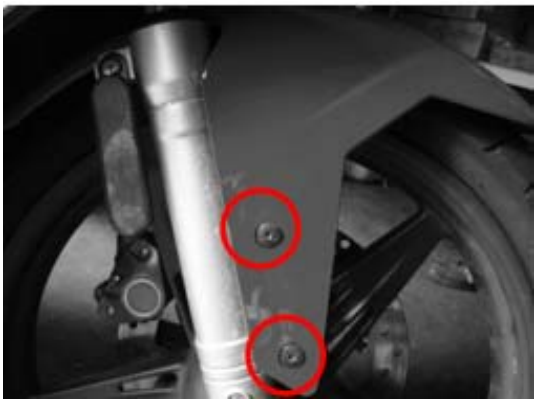
LEG SHIELD,2 REMOVAL

Disconnect “TANK-COVER”



FRONT FENDER REMOVAL

Removal 4 pan head screw



REAR FENDER,2 REMOVAL

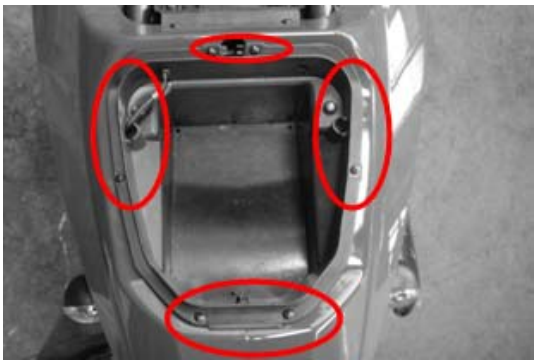
Removal4 screw (A)

Renival 2 bolt (B)

LUGGAGE,2 REMOVAL

Removal 6 screw

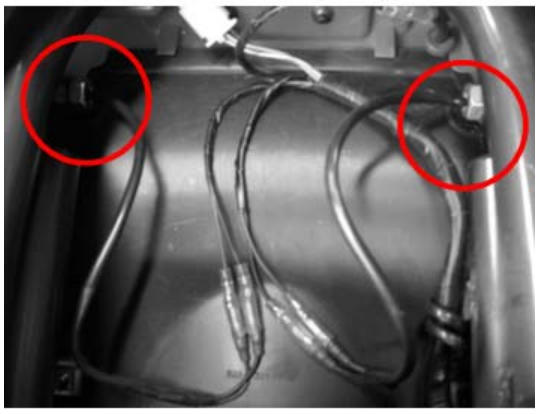
Removal 3 flange bolt



XI.FRAME

FLASHER LIGHT ASSY,3 REMOVAL

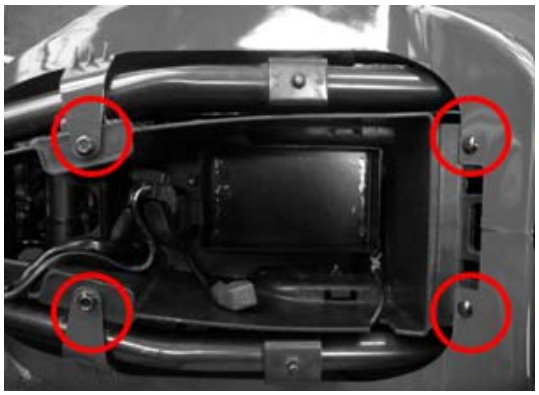
Removal 2 nut



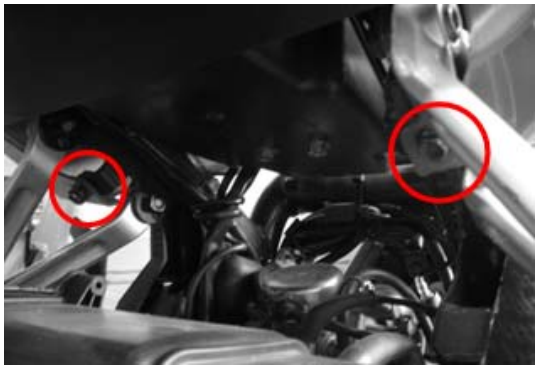
SIDE COVER,1&2 REMOVAL

Removal 2 screw

Removal 2 flange bolt



Removal 2 bolt



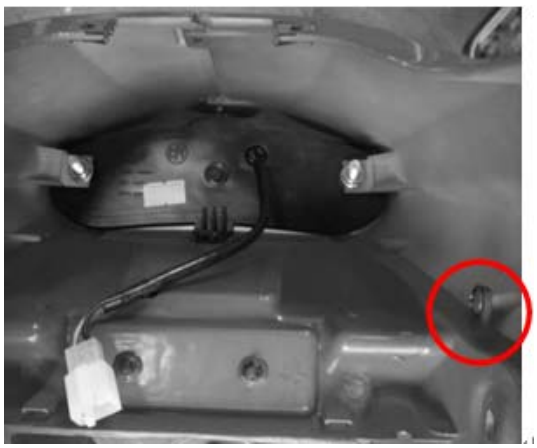
Removal 2 bolt w/washer

Removal 1 screw

XI.FRAME

LICENSE BRACKET,1 REMOVAL

Removal 2 screw



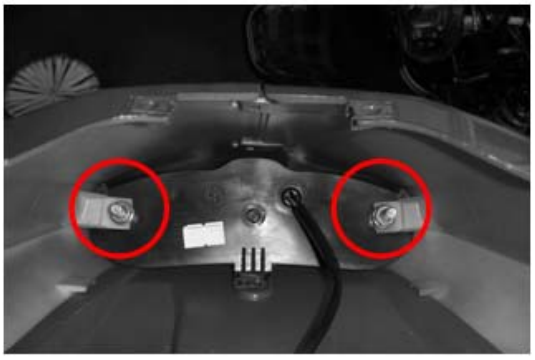
LICENSE LIGHT ASSY REMOVAL

Remoal socket bolt

Removal nut

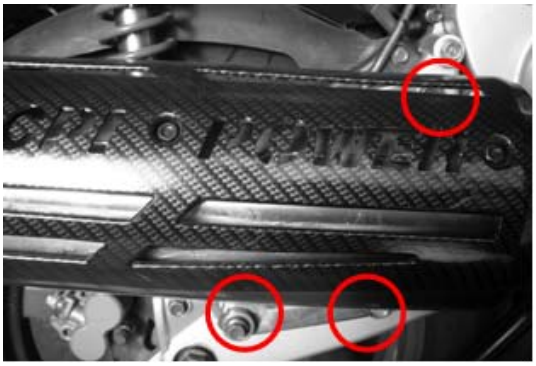
TAIL LIGHT REMOVAL

Removal 2 nut



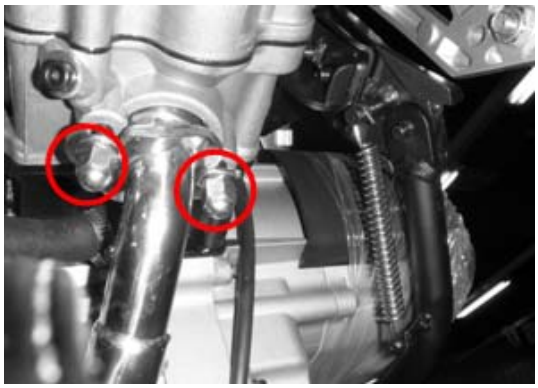
REAR FENDER,1 REMOVAL

Removal 3 bolt



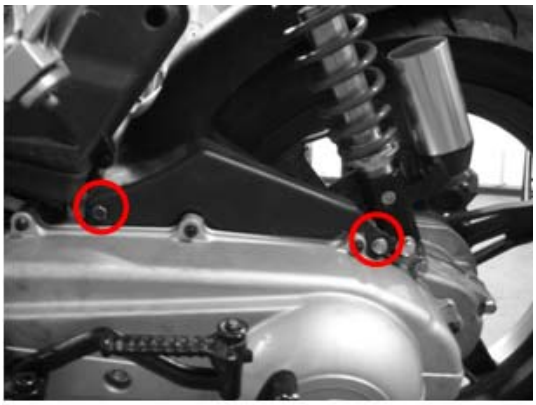
XI.FRAME

Removal 2 nut



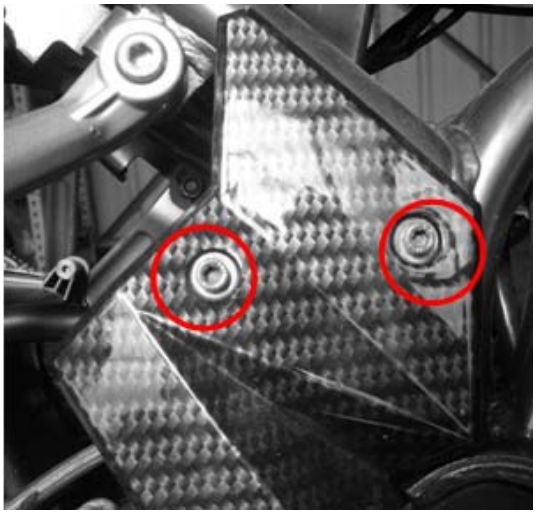
Removal 2 bolt

Removal 2 bolt



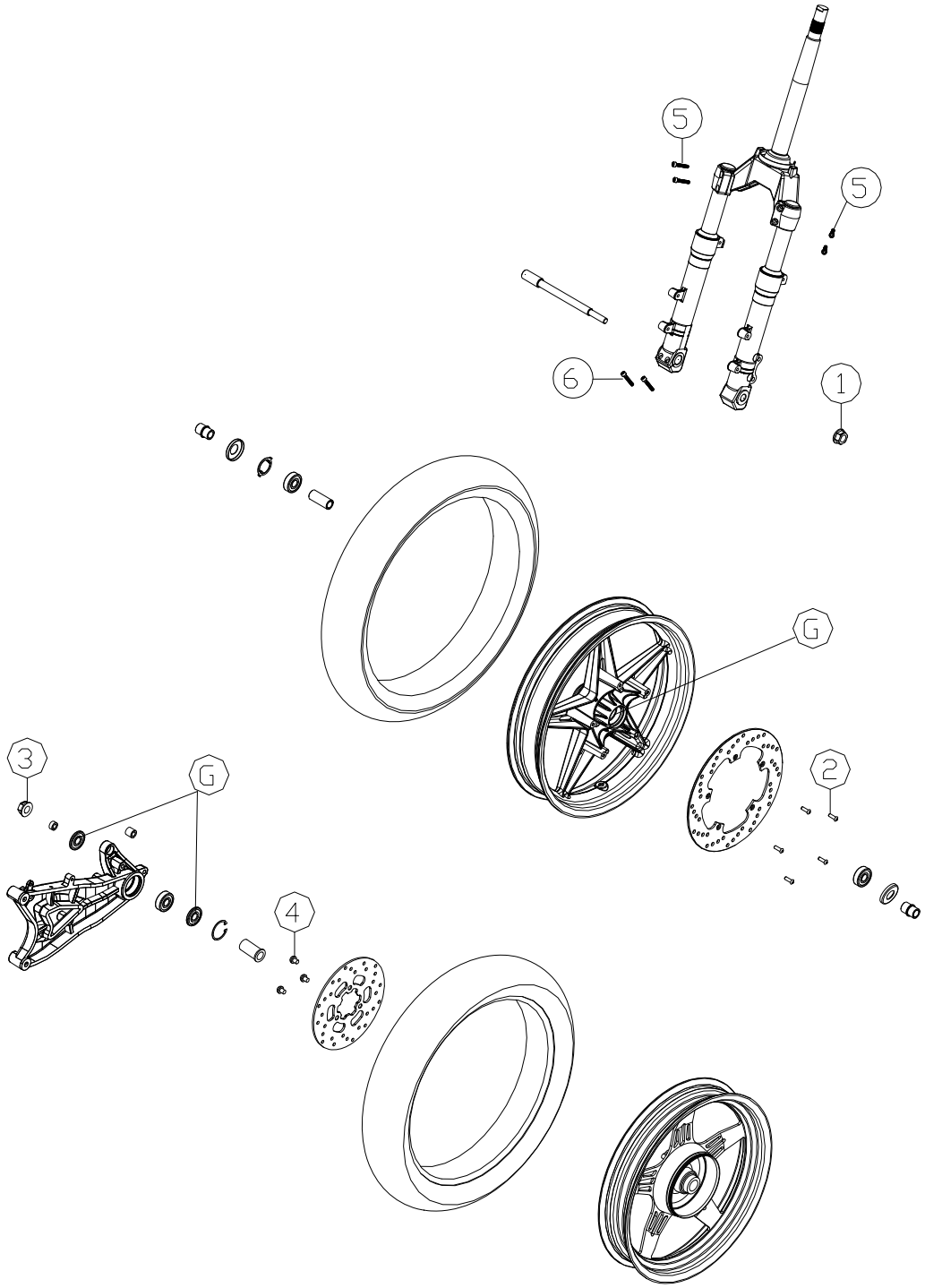
SIDE COVER,3&4 REMOVAL

Removal 4 socket bolt



XII.WHEEL & BRAKE SYSTEM

WHEEL EXPOLODED VIEW



XII.WHEEL & BRAKE SYSTEM

No.	Fastener	Torque			Remark
		N-m	Kgf-m	Ft-lb	
1	Front axle nut	44.1	4.5	32.5	
2	Front disc bolt	13.7	1.4	10.1	
3	Rear axle nut	122.5	12.5	90.2	
4	Rear disc bolt	27.4	2.8	20.2	
5	Socket bolt(M8)	24.5	2.5	18	
6	Socket bolt(M6)	14.7	1.5	10.8	

G: APPLY GREASE

WHEEL RIM/TIRE INFORMATION		
	RIM	TIRE
FRONT WHEEL	2.5-17"	110/70-17 54H
	3.0-17"	110/70-17 54H

TIRE PRESSURE INFORMATION		
FRONT/ AVANT	1PERSON	32PSI/2.3BAR
	2PEOPLE	36PSI/2.5BAR
REAR/ ARRIERE	1PERSON	32PSI/2.3BAR
	2PEOPLE	36PSI/2.5BAR

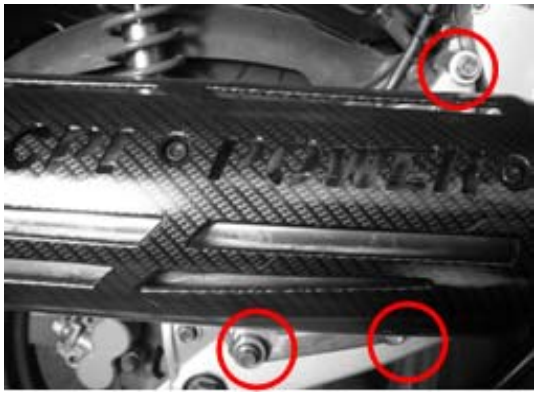
REAR WHEEL	2.5-16"	120/80-16 60H

XII.WHEEL & BRAKE SYSTEM

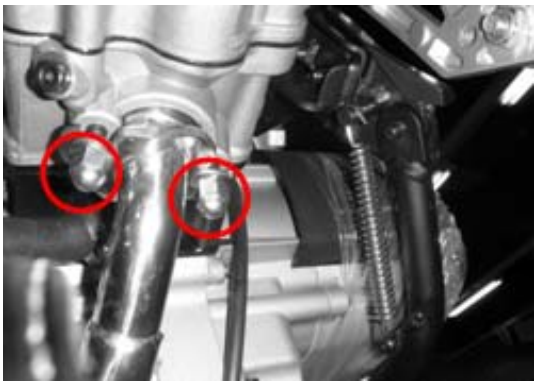
METHOD TO REMOVE THE REAR WHEEL

REMOVAL EXHAUST PIPE

Removal 3 bolt



Removal 2 nut



REMOVAL REAR FENDER.

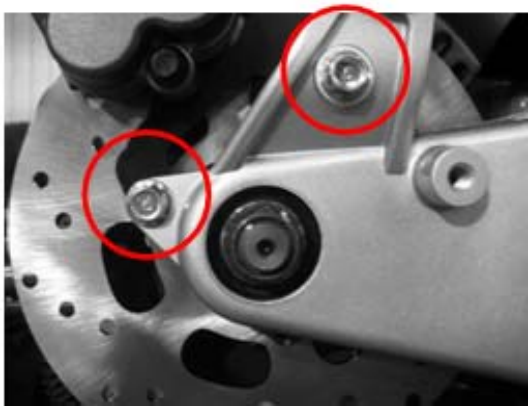
Removal 2 bolt

Removal 2 bolt

XII.WHEEL & BRAKE SYSTEM

R.R. CALIPER ASSY REMOVAL

Removal 2 bolt

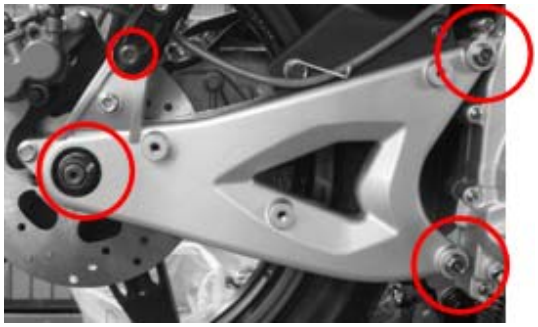


R.R. SWING ARM REMOVAL

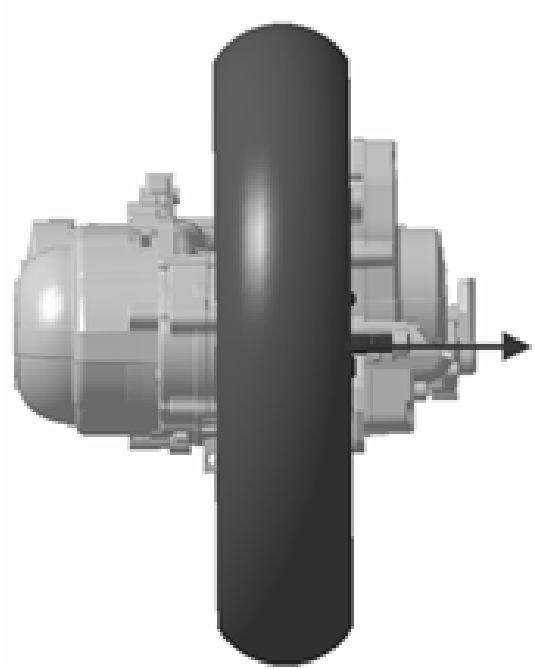
Removal “REAR WHEEL NUT“

Removal 2 bolt

Removal 1 bolt



REMOVAL THE REAR WHEEL.



INSTALL REAR WHEEL:

OPPSITE TO THE REMOVING OF IT

TORQUE:

M6:1.2-1.5 kg-m

M8:2.2-3.0 kg-m

M10:4.0~5.0 kg-m

M14:11.5-12.5 kg-m

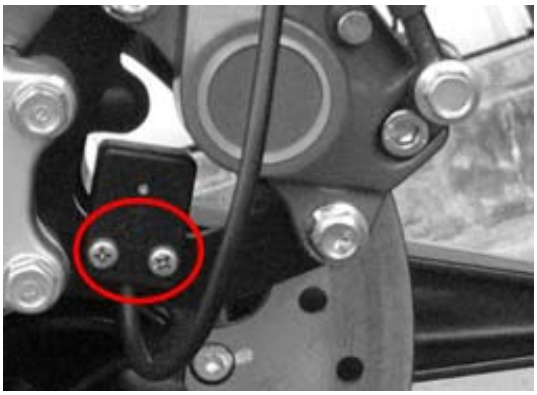
XII.WHEEL & BRAKE SYSTEM

FRONT WHEEL REMOVAL

Raise the front wheel off the grand ground by placing a block or safety stand.

Disconnect the speedometer cable.

Remove 2 pan head bolt



REMOVE THE AXLE SHAFT.

Remove front axle nut

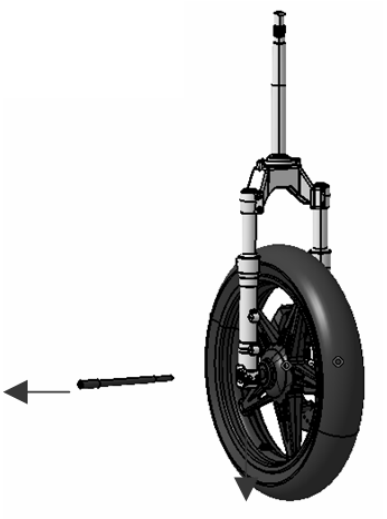
Remove 2 socket bolt (M6)

XII.WHEEL & BRAKE SYSTEM

REMOVE THE FRONT WHEEL.

Removal front axle

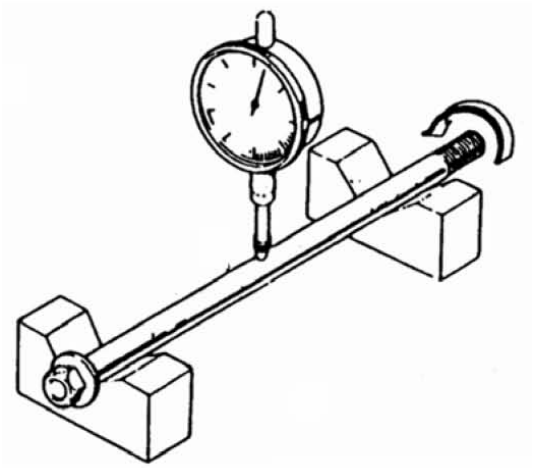
Removal front wheel



AXLE SHAFT INSPECTION

Measure the axle shaft run out.

SERVICE LIMIT: 0.2 mm



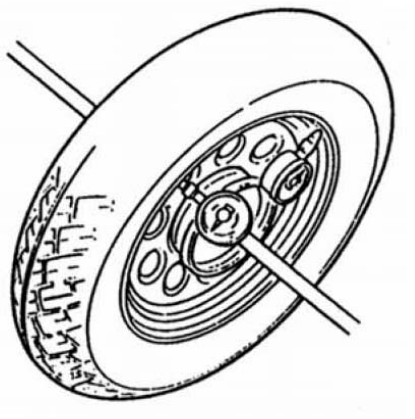
FRONT WHEEL RIM RUNOUT INSPECTION

Measure the wheel rim run out.

SERVICE LIMIT:

Radial: **2.0mm**

Axial: 2.0mm

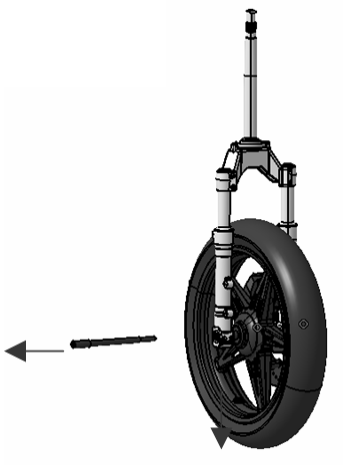


XII.WHEEL & BRAKE SYSTEM

FRONT BRAKE DISK CHANGE

REMOVEAL FRONT WHEEL

Refer to 12-5~12-6



BRAKE DISC REMOVAL

Removal 5 bolt

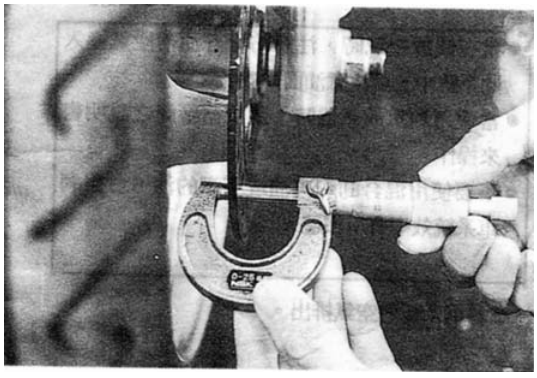
BRAKE DISK INSPECTION

Brake disc thickness.

SERVICE LIMIT: 3.0mm

Brake disk flatness.

SERVICE LIMIT: 0.3mm



INSTALL FRONT BRAKE DISC

The installation sequence is essentially the reverse of removal.

Opposite to the removing of it torque:

M6:1.2-1.5kg-m

XII.WHEEL & BRAKE SYSTEM

REAR BRAKE DISK CHANGE

REMOVEAL REAR WHEEL

Refer to 12-3~12-4

BRAKE DISC REMOVAL

Removal 3 bolt

BRAKE DISK INSPECTION

Brake disc thickness.

SERVICE LIMIT: 3.0mm

Brake disk flatness.

SERVICE LIMIT: 0.3mm

INSTALL REAR BRAKE DISC

The installation sequence is essentially the reverse of removal.

Opposite to the removing of it torque:

M6:1.2-1.5kg-m

XII.WHEEL & BRAKE SYSTEM

BRAKE PAD CHANDGE (FRONT)

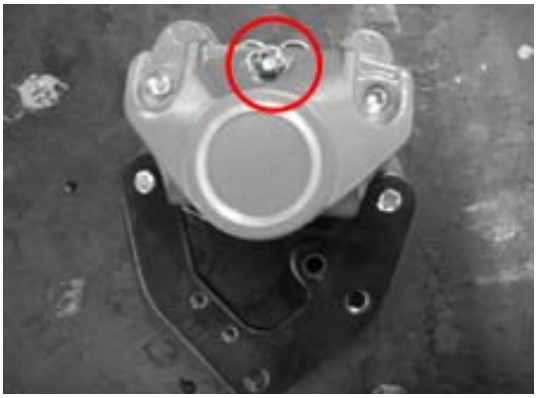
BRAKE MASTER CYLINDER REMOVAL

Removal the caliper from the front fork.

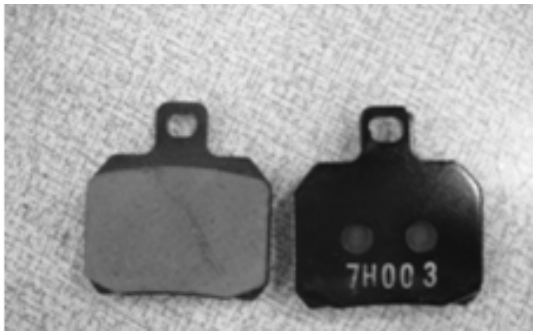
Removal 2 bolt

Brake pad Remove

Removal pin



Change brake pad



The installation sequence is essentially the reverse of removal.

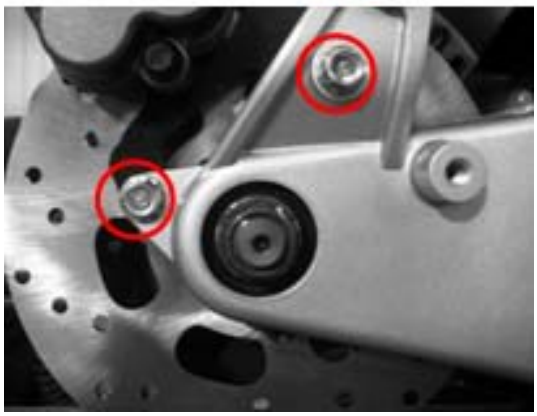
XII.WHEEL & BRAKE SYSTEM

BRAKE PAD CHANGE (REAR)

BRAKE MASTER CYLINDER REMOVAL

Removal the caliper from the R.R. SWING ARM

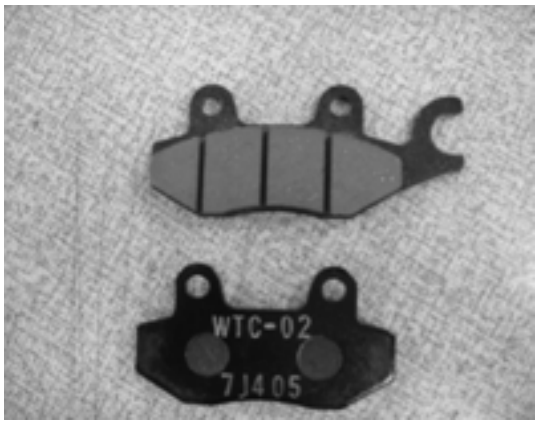
Removal 2 bolt



Brake pad Remove

Removal 2 pin

Change brake pad



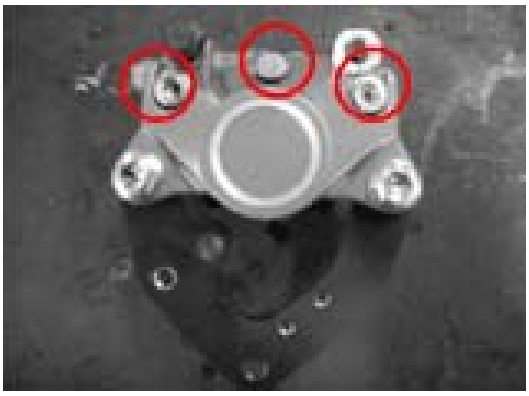
The installation sequence is essentially the reverse of removal.

XII.WHEEL & BRAKE SYSTEM

CALIPER RESOLVE (FRONT)

Removal 2 bolt

Removal 1 pin



Measure the caliper PISTON O.D.

SERVICE LIMIT: 30.20 mm

Measure the caliper cylinder I. D.

SERVICE LIMIT: 30.25mm

XII.WHEEL & BRAKE SYSTEM

CALIPER RESOLVE (REAR)
BRAKE PAD REMOVAL
Removal 2 pin

REMOVAL PISTON

Measure the caliper PISTON O.D.
SERVICE LIMIT: 30.20 mm
Measure the caliper cylinder I. D.
SERVICE LIMIT: 30.25mm

The installation sequence is essentially the reverse of removal.

XII.WHEEL & BRAKE SYSTEM

DISK BRAKE SYSTEM

BRAKE OIL INSPECTION

Normal fluid lever is between upper and lower.

DISK BRAKE SYSTEM

BRAKE OIL INSPECTION

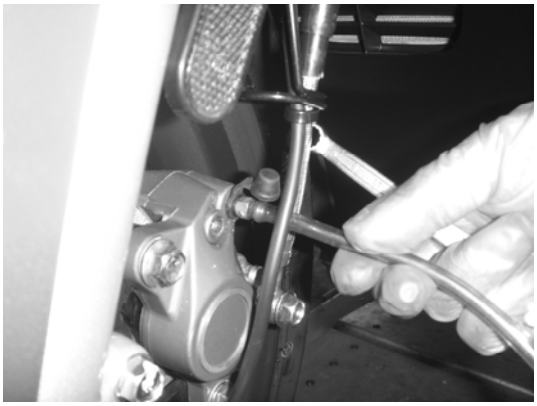
Normal fluid lever is between upper and lower.

BRAKE OIL CHANGING (FRONT)

DRAIN THE BRAKE OIL

1.Release the brake oil passage

2.Drain the brake oil



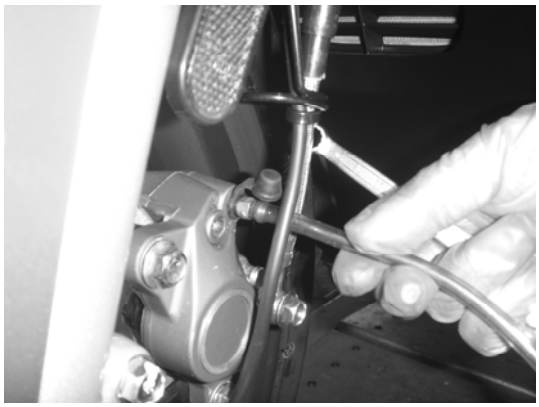
XII.WHEEL & BRAKE SYSTEM

3.Open the cap to help drain
Removal 2 bolt

EMPTY INTO NEW BRAKE OIL

1..Fill with new brake oil (DOT-3, DOT-4)

2.Leak out the air



ATTENTION!!!
This step(1&2) must working together until not have air in brake oil tube

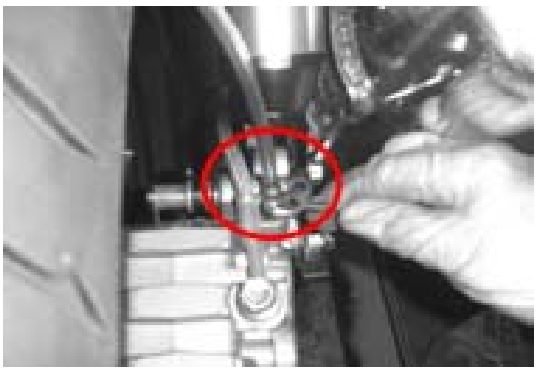
XII.WHEEL & BRAKE SYSTEM

BRAKE OIL CHANGING (REAR)

DRAIN THE BRAKE OIL

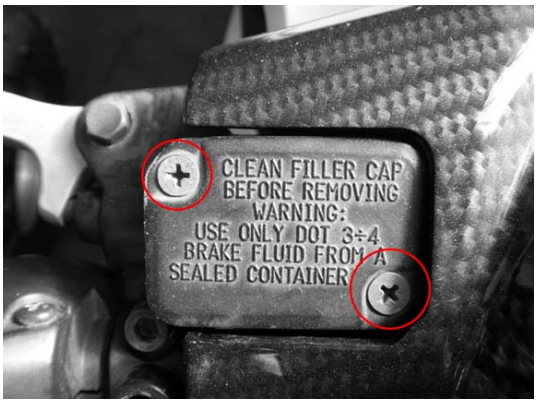
1.Release the brake oil passage

2.Drain the brake oil



3.Open the cap to help drain

Removal 2 bolt

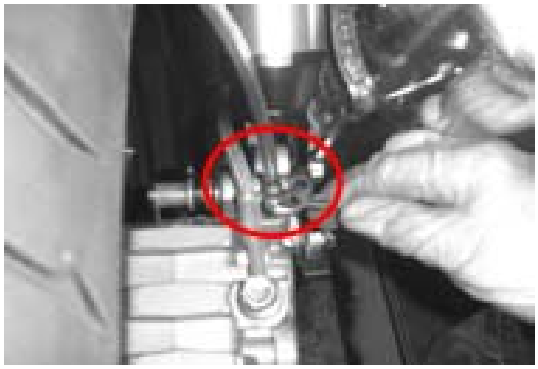


EMPTY INTO NEW BRAKE OIL

1.Fill with new brake oil (DOT-3, DOT-4)

XII.WHEEL & BRAKE SYSTEM

2.Leak out the air

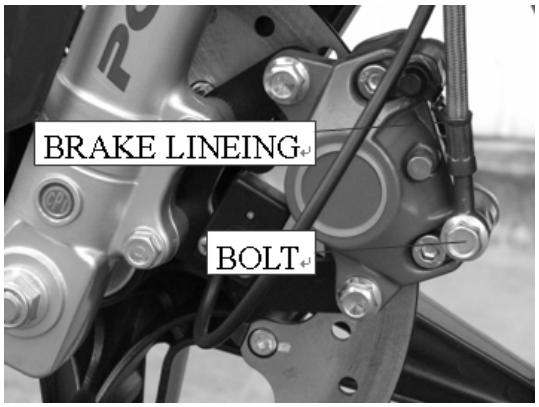


ATTENTION!!!
This step(1&2) must working together until not have air in brake oil tube

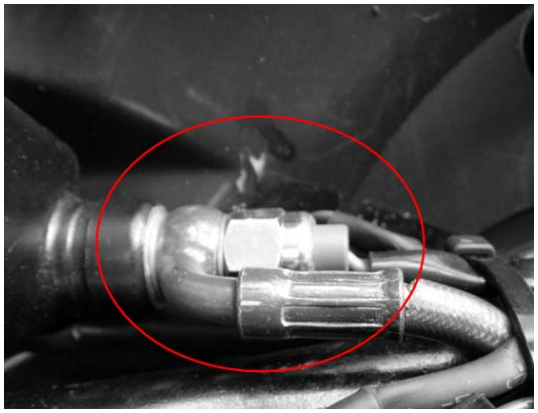
BRAKE LINING CHANGE(FRONT)

1. Drain the brake oil
(Refer to 12-13 ~ 12-14)

2. Remove the brake caliper setting bolts.
Remove the brake lining.



3.Removal “STOP SWITCH ASSY” on “MASTER CYLINDER ASSY.1”



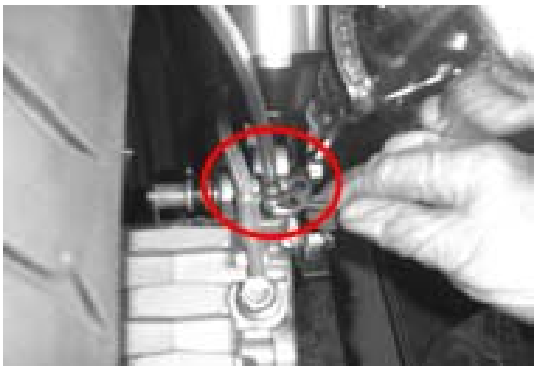
4.Change brake lining

5.Install process to refer to reverse of removal.

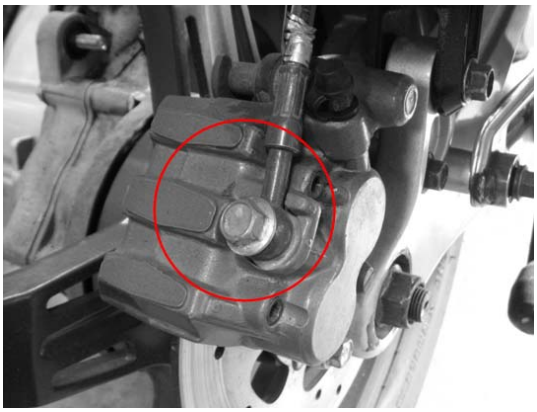
XII.WHEEL & BRAKE SYSTEM

BRAKE LINING CHANGE(REAR)

1. Drain the brake oil
Refer to 12-15



2. Remove the brake caliper setting bolts.
Remove the brake lining.



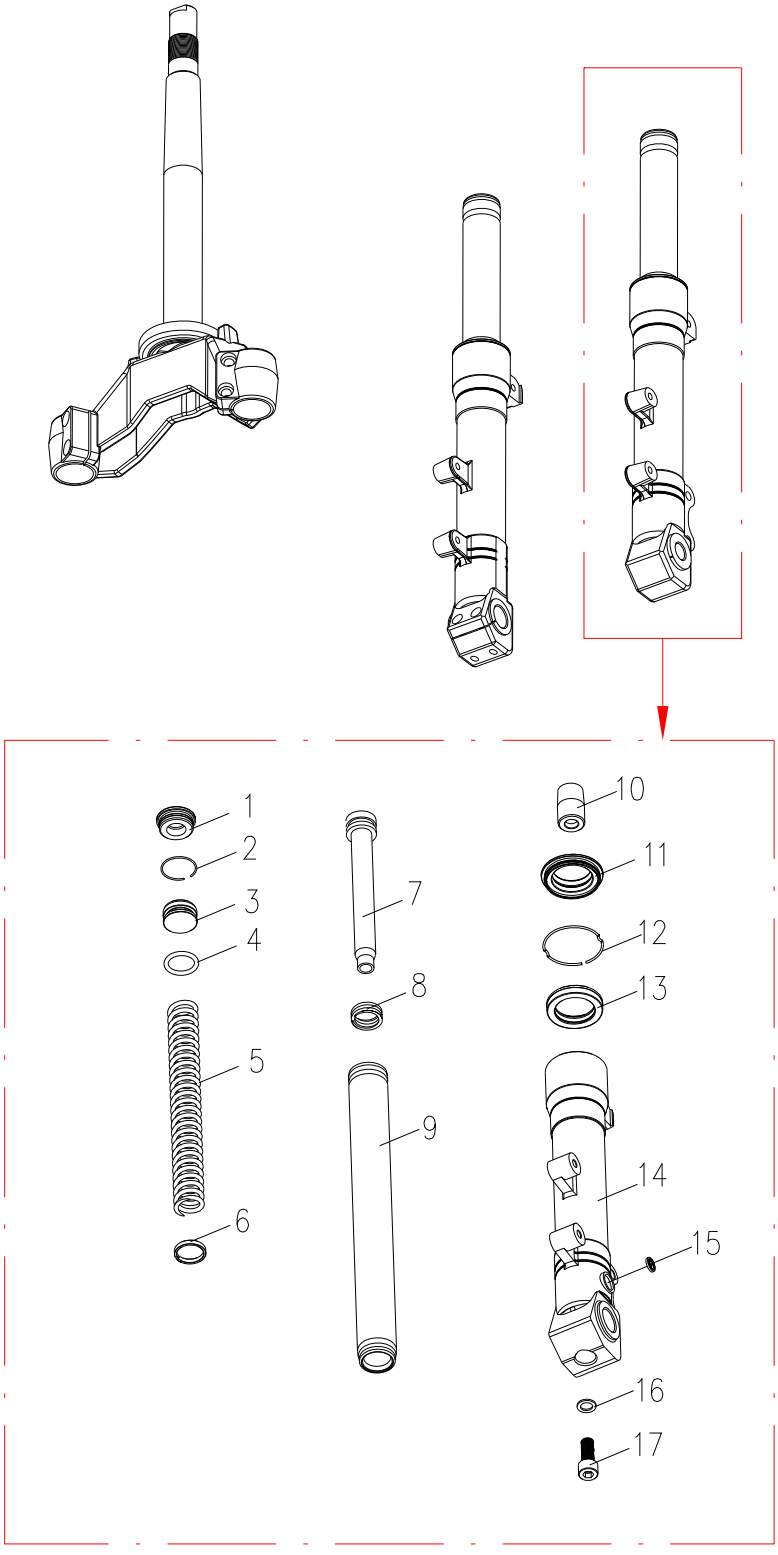
3.Removal “STOP SWITCH ASSY” on “MASTER CYLINDER ASSY.2”

4.Change brake lining

5.Install process to refer to reverse of removal.

XII.WHEEL & BRAKE SYSTEM

FRONT FORK EXPOLODED VIEW



XII.WHEEL & BRAKE SYSTEM

FRONT FORK REMOVAL

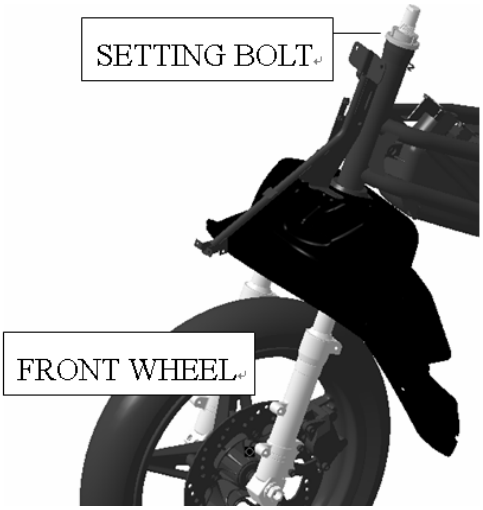
REMOVE THE FRONT WHEEL.

Refer to 13-5~13-6

Remove the front for setting bolt.

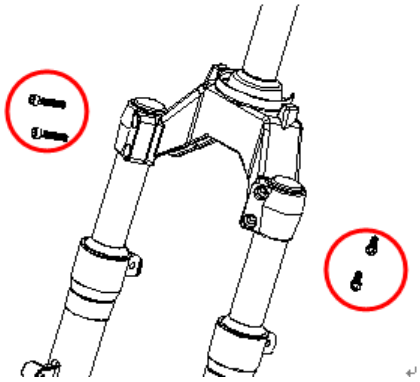
Refer to 12-8

Remove the front fork.



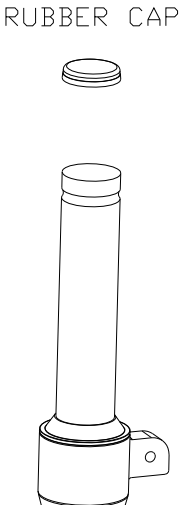
FORK TUBE REMOVAL

Removal 4 socket bolt



FORK TUBE RESOLVE

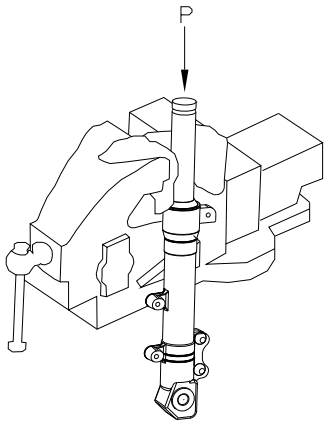
Removal the rubber cap



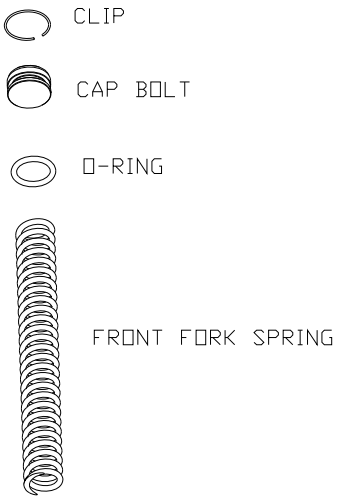
XII.WHEEL & BRAKE SYSTEM

FORK TUBE RESOLVE

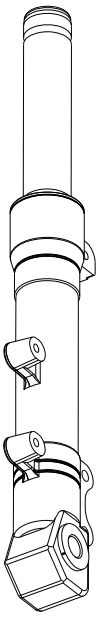
1. Hold the fork tube in a vice
2. To bring pressure to bear on center for 5 to 7kg



3. Removal clip
4. Removal cap bolt
5. Removal o-ring
6. Removal front fork spring



NOTE
Does not damage the fork tube while? this operation.

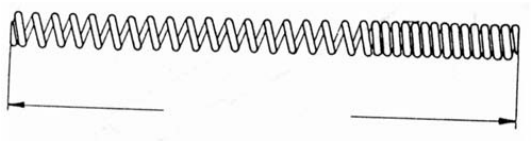


XII.WHEEL & BRAKE SYSTEM

FRONT FORK INSPECTION

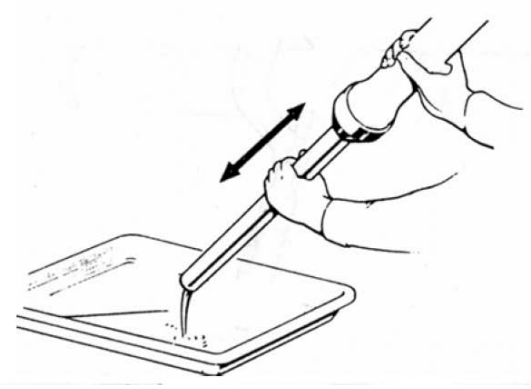
Measure the fork spring free length.

SERVICE LIMIT: 235.7mm



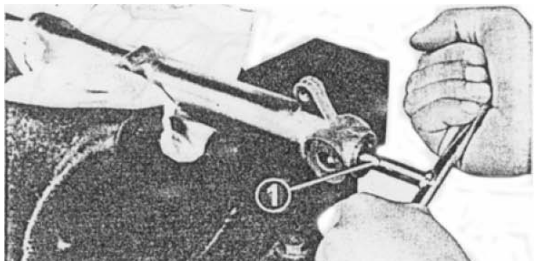
Drain the fork from the top of the front fork.

Pour out any remaining fluid by pumping the fork up and down several times.



Hold the bottom case in a vice.

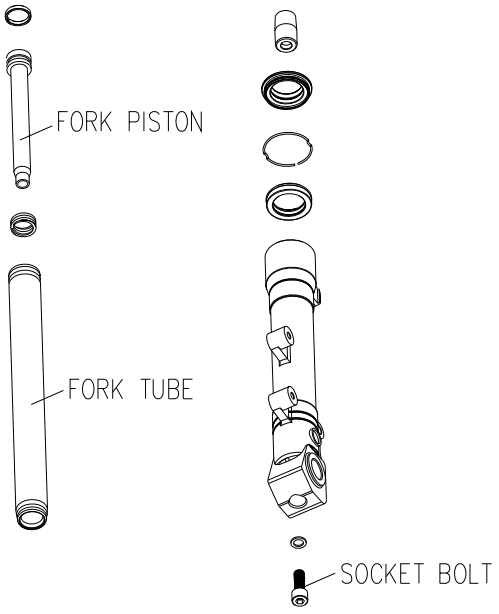
Remove the socket bolt with an Allen wrench.



REMOVE THE FORK PISTON

REMOVE THE FORK TUBE

Check each part for wear or damage and replace if necessary.



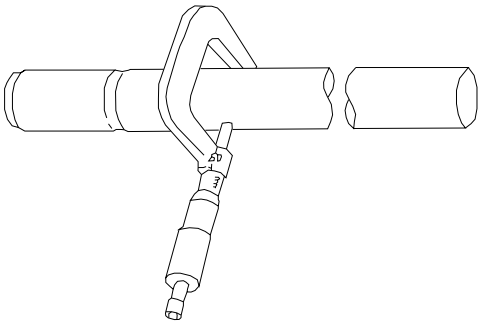
XII.WHEEL & BRAKE SYSTEM

FORK TUBE INSPECTION

Place the fork tube in V-blocks and measure the run out with a dial indicator gauge.

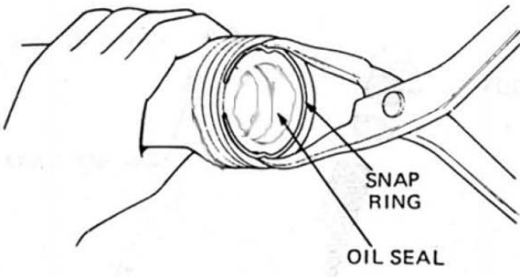
The actual run out is 1/2 of TIR (*Total Indicator Reading*).

SERVICE LIMIT: 0.2mm



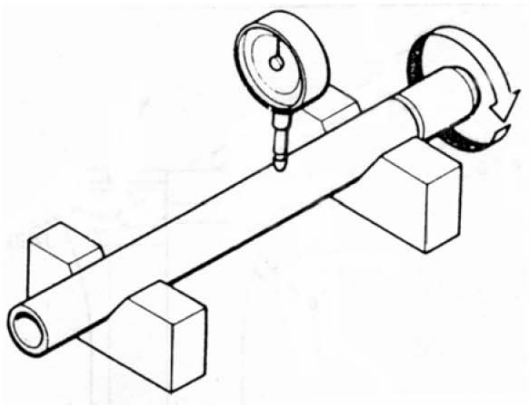
Measure the fork tube O. D. at the several points along the sliding surface.

SERVICE LIMIT: 30.9mm



Remove the dust seal cover.

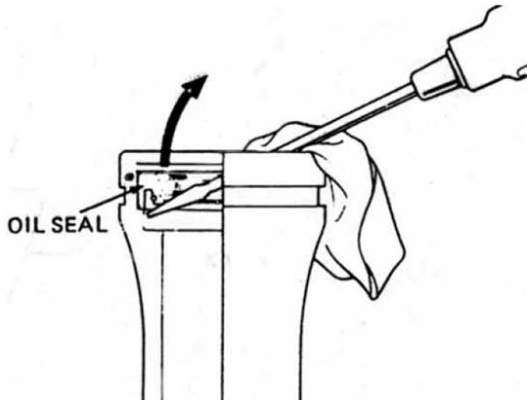
Remove the snap ring with a snap ring pliers.



XII.WHEEL & BRAKE SYSTEM

REMOVE THE OIL SEAL.

NOTE
Avoid damaging the inner and outer surfaces of the slider when removing the seal and set ring.



BOTTOM CASE INSPECTION

Check the inside sliding surface of the bottom case for wear or damage. Measure the bottom case I. D.

SERVICE LIMIT: 31.1mm

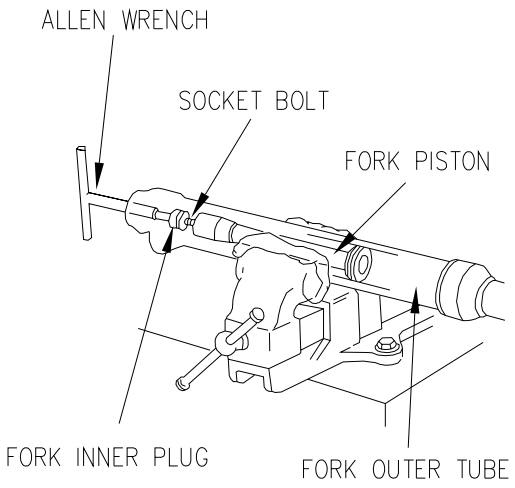
XII.WHEEL & BRAKE SYSTEM

FRONT FORK ASSEMBLY

Before assembly, wash the parts in solvent and wipe them off completely.

Insert the fork piston into the fork outer tube and set the inner tube plug on the end of the fork piston.

Insert the parts into the fork slider and tighten the socket bolt with the 6mm Allen wrench.

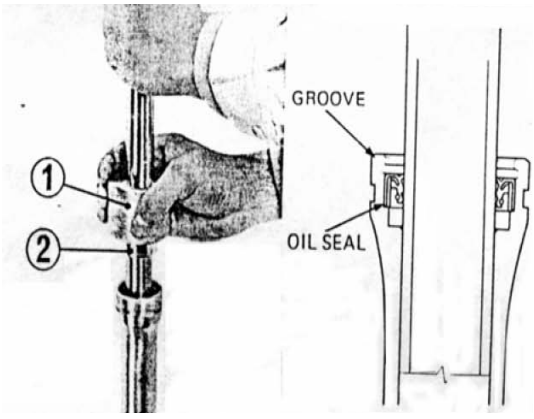


NOTE
Apply locking agent to the socket bolt.

TORQUE:

1.8~2.3 Kg-m

Install the oil seal in the top of the slider with a fork seal driver.



NOTE
Apply ATF (Automatic Transmission Fluid) to the oil seal and install it with the fork seal driver. The fork seal is seated when the Groove in the slider is visible at the top of the seal.

Install the snap ring into the groove of the fork bottom case with snap ring pliers. Fill the forks with good quality ATF (*Automatic Transmission Florid*).

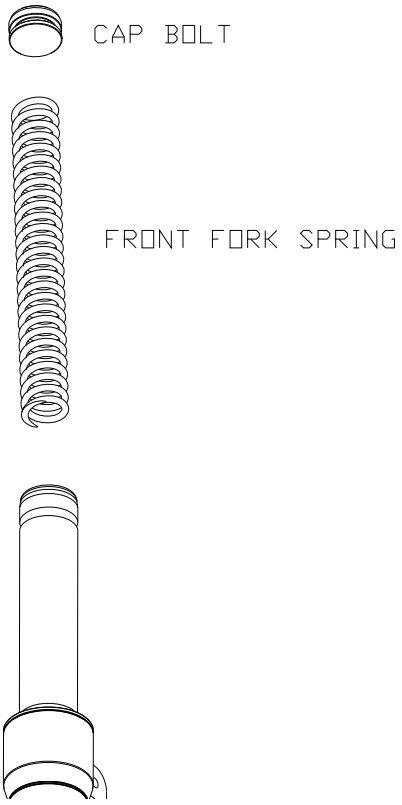
CAPACITY : 86∓1 cc

XII.WHEEL & BRAKE SYSTEM

Install the fork spring into the fork tube.

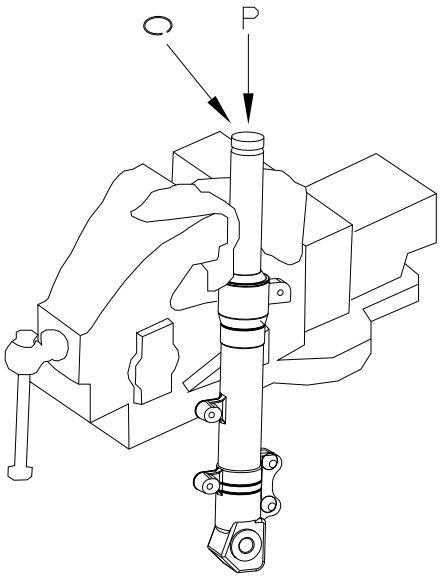
1. Install the fork spring into the fork tube.

Be care for fork spring rebound.



2. Install the cap bolt

3. To bring pressure to bear on cap bolt for 5 to 7kg.



4. Install the clip into the fork tube on the cap bolt.

NOTE
Hold the fork tube in a vice. Tighten the fork bolt.

TORQUE:

4.0~5.0 Kg-m

XII.WHEEL & BRAKE SYSTEM

MEMO….

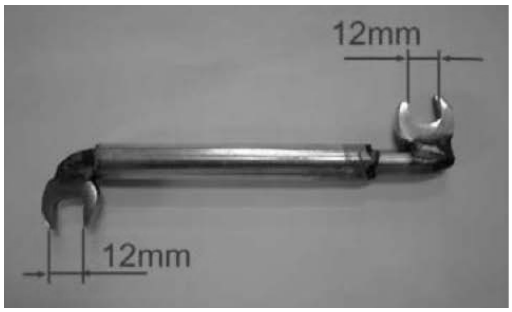
XIII.ADDENDUN

SPECIAL TOOLS

1. FOR FRAME ASSEMBLY

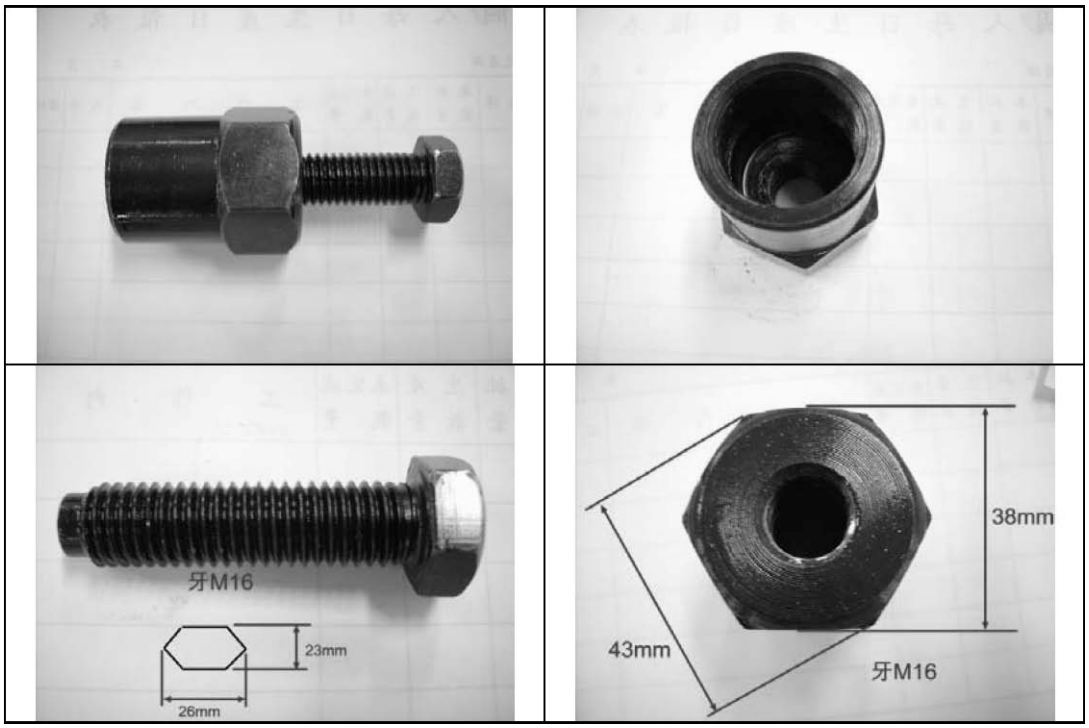
For the front fork

For the brake sensor

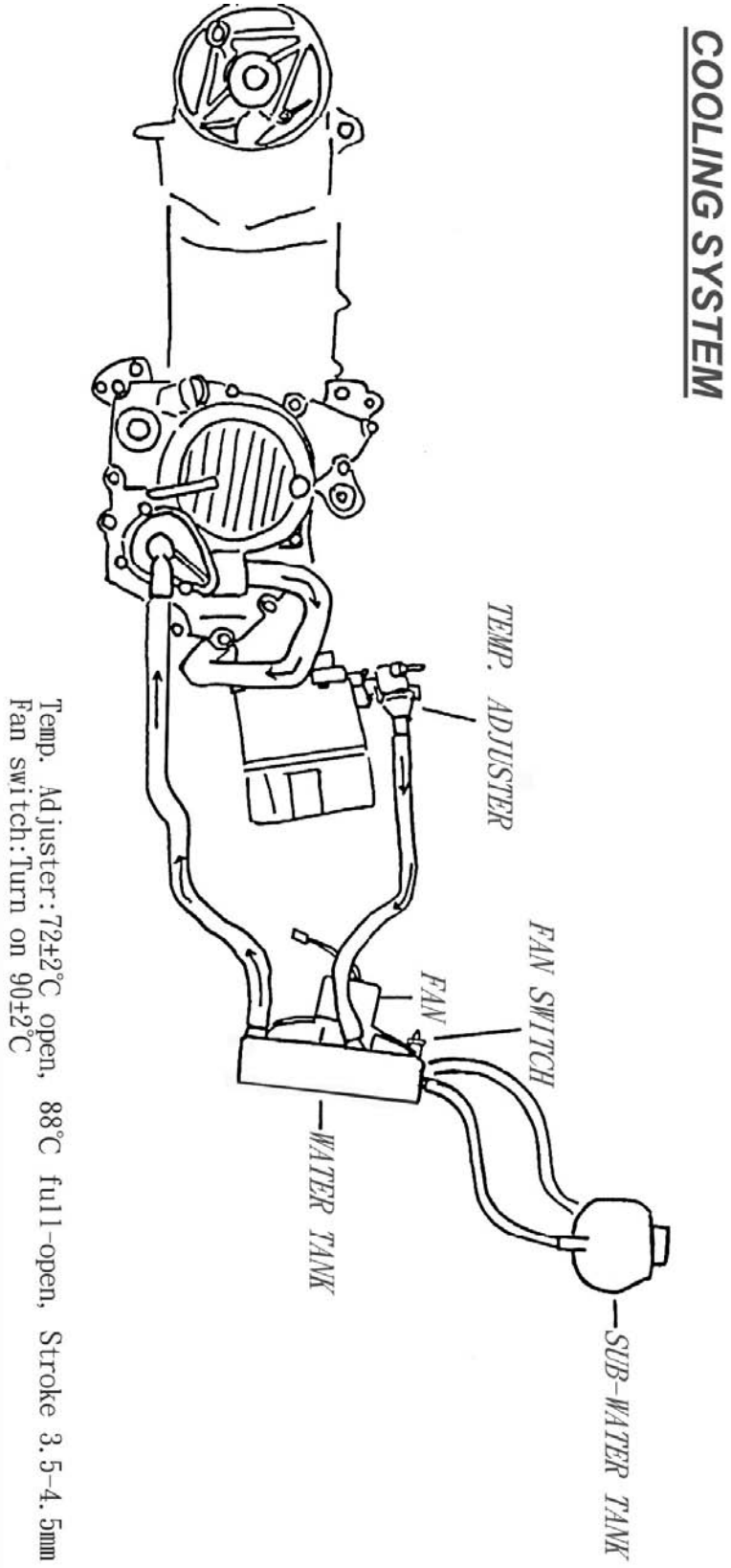


2. FOR ENGINE ASSEMBLY

For A.C.G.



XIII.ADDENDUN



XIII.ADDENDUN

MEMO….

XIII.ADDENDUN

Collaboration
Professional
Innovation